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EXPERIMENTAL WATER FILTER PLANT AT CLEVELAND

To Determine Best Methods of Removing Pollution, Turbidity and Temporary Hardness from the Present Supply of Lake Erie Water—Description of Plant—Results of Tests—Boiler Tests

By M. F. STEIN* and G. E. FLOWER.†

As part of the preliminary work preceding the design of the Cleveland (Ohio) water filtration plant, an experimental filter was built and placed in service during July, 1913, and has been operated since.

The experimental filter plant is located adjacent to the Kirtland pumping station, and is of the mechanical type, designed for softening as well as purification. It has a capacity of 100,000 gallons per day, but for a portion of the time has been operated at 50,000 gallons per day. Essentially the plant consists of a mixing chamber of 30 minutes' capacity; settling basin of 2.5 hours' period (both of these at the 50,000 gallons per day rate); rapid sand filter, rated at 100,000 gallons per day on the usual basis of 125,000,000 gallons per acre per day; solution tanks, orifice boxes and chemical piping, and a wash water tank of 1,500 gallons capacity. Being for temporary use, the basins and tanks are of wood and are housed in a wooden building, weather-proofed with tar paper.

The source of supply is the shore end of the 9-foot tunnel from the 4-mile crib to the pumping station, the water for the test plant being taken at a point prior to the introduction of bleach, with which the city supply is treated. A small steam pump raises the water from the intake to the mixing chamber. The coagulants used are iron sulphate, introduced into the suction of the pump, and lime, which is added as the water enters the mixing chamber.

The function of the mixing chamber consists in bringing about a thorough admixture of the chemicals and the water, thereby favoring a complete reaction, as well as causing a coarse precipitate to form by bringing together the particles during incipient precipitation. This chamber consists of a portion of the original settling basin, divided by baffles into 210 compartments, each 3 by 6 inches, through which the water takes a devious course, traveling both vertically and transversely, a total distance of 1,050 feet.

After passing through the mixing chamber the water enters the settling basin proper, which is 32 feet long, 5 feet wide and 4.5 feet deep to the flow line. Here the treated water is retained from two to three hours. This basin is unbaffled, except for a skimming weir at the outlet end, and a weir to force the water upward at the inlet end.

The water then passes to the filter (of the circular wooden type, 8 feet in diameter). The filtering mate-

rial consists of a 24-inch layer of crushed quartz sand (effective size about 0.4 mm., uniformity co-efficient 1.5), resting on 12 inches of graded gravel from $\frac{1}{4}$ to $\frac{1}{2}$ inch in size. A galvanized wire screen between the sand and gravel prevents the latter from being displaced during washing. The collector system is of the false bottom type, consisting of a No. 12 gauge plate perforated with $\frac{3}{32}$ -inch holes on 1-inch centers. An air manifold, consisting of $\frac{1}{2}$ -inch pipes, 6 inches center to center, drilled with $\frac{3}{32}$ -inch holes on 6-inch centers, is provided, but has been used but little. The filtrate passes over a 6-inch weir and through a 4-inch pipe to the boiler house, where it is used for feed water.

The chemical solution tanks, located on the second floor of the plant, consist of two lime and two iron solution tanks. The quicklime (88 to 90 per cent. CaO) is slaked before being placed in the solution tanks, the emulsion in the tanks being agitated by compressed air. The iron sulphate (95 to 97 per cent $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$) is dissolved without agitation. Two orifice boxes are provided for measuring the solutions.

The wash water tank is located above the solution tanks, giving an average head of 20 feet at the false bottom of the filter. Two wash water overflow troughs are provided in the filter, placed respectively at 18 and 36 inches above the sand.

The principal difficulties experienced with Lake Erie water at Cleveland, and which have led to filtration, are pollution and turbidity. The pollution is most marked in the early spring, when the ice in the harbor and the lower portion of the Cuyahoga River breaks up and is carried out past the intake crib. There is also a small but continual pollution from local sewers and passing ships, which requires that the water be chlorinated at all times. Even with the most careful regulation it is impossible at times to prevent the characteristic iodoform taste caused by so treating the water, and popular prejudice against this has been a factor in deciding on filtration. The turbidity generally follows storms, and, while not excessive, is extremely fine and very slow to settle out.

The objects to be attained by purification at Cleveland are the removal of pollution and turbidity, and in addition the softening of the water to the extent of removing temporary hardness.

The first two months of operation were consumed in breaking in the plant and making such minor changes as were required by the special conditions to be met. The principal difficulty encountered was with bacterial

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RESULTS OBTAINED AT KIRTLAND STREET TESTING STATION. PART 1.
TABLE NO. I, OCTOBER 20TH TO 30TH, 1913.

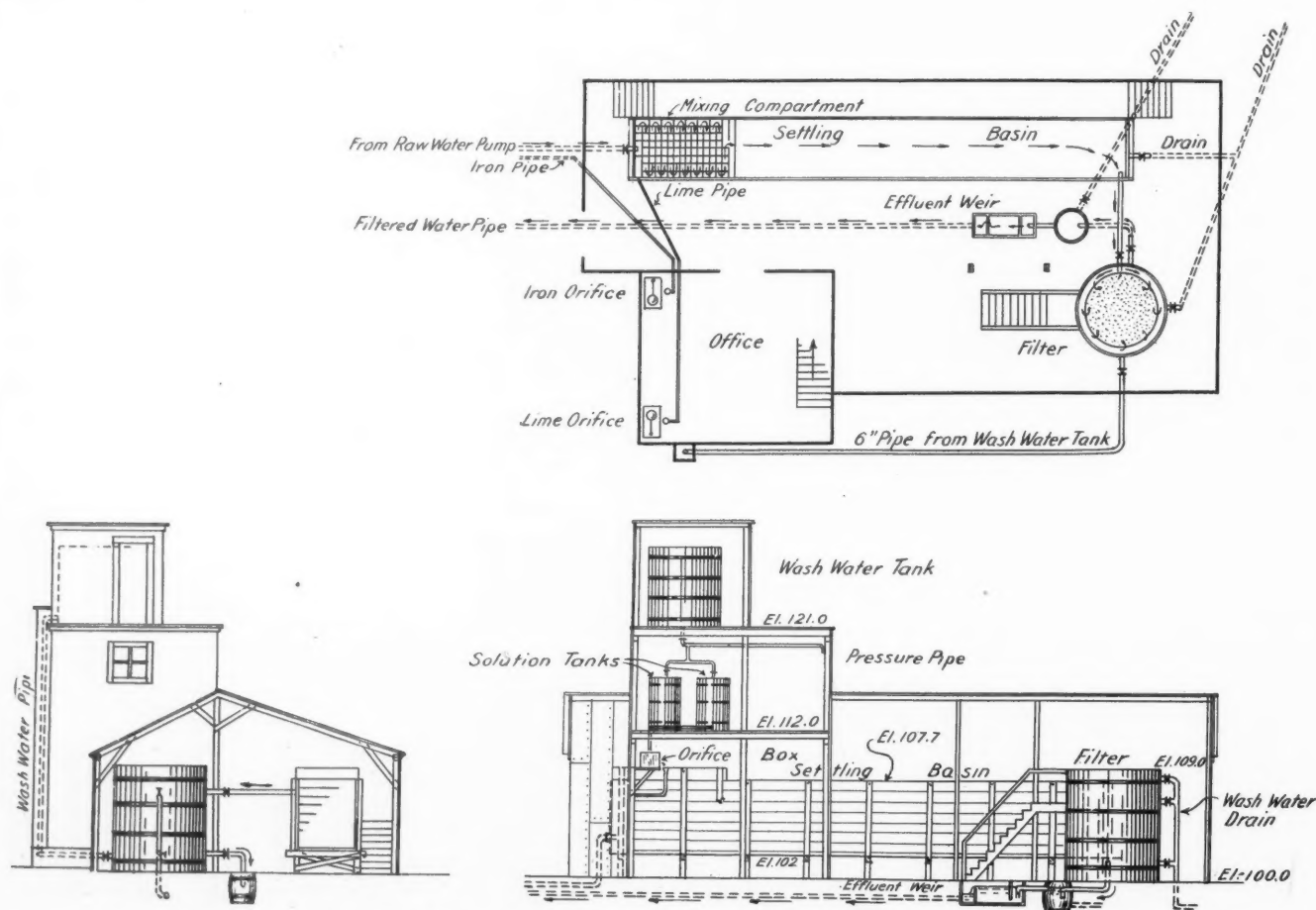
Date.	Hours operated.	Temp. of water, Deg. F.	Pumpage of filter- ed water, 1,000 Gals.	Mixing chamber, flow period, hrs.	Coag. tank, No. of hours detention.	Filter Data		Chemicals applied Grains per Gal.	Chemical Data.		Hardness	Soap method.				
						Rate M. G. A. D.	Av. No. of hours run between washings.		Turbidity	Non- carbonate.			Total			
20	9.7	59	54	—	1.0	129	5.1	5.3	.48	.28	0	20	112	68	87	59
21	11.0	58	63	—	1.0	132	3.7	7.2	.47	.90	0	20	15	114	71	87
22	11.8	57	66	—	1.0	130	5.1	5.2	.50	.55	0	20	20	112	66	87
23	11.2	57	63	—	1.0	131	4.4	6.2	.48	.55	0	20	20	110	60	87
24	11.5	57	65	—	1.0	130	4.5	5.9	.51	.23	1	20	20	108	62	87
25	7.8	58	44	—	1.0	130	4.8	5.5	.50	.29	0	20	20	110	64	87
27	11.2	57	62	—	1.0	128	4.4	6.4	.54	.25	0	20	20	112	72	89
28	11.0	56	63	—	1.0	135	4.5	6.0	.47	.45	0	20	20	112	56	89
29	11.1	56	63	—	1.0	132	3.9	6.7	.48	.35	0	20	20	114	62	89
30	11.2	55	63	—	1.0	130	4.4	6.1	.49	.28	0	20	20	114	64	87

TABLE NO. II, JANUARY 2ND TO 14TH, 1914.

January	Temp. of water, Deg. F.	Pumpage of filtered water, 1,000 Gals.	Mixing chamber, flow period, hrs.	Coag. tank, No. of hours detention.	Rate M. G. A. D.	Av. No. of hours run between washings.	Per cent. wash water.	Lime	Iron.	Raw.	Filtered.	Raw.	Filtered.	Raw.	Filtered.	Raw.	Filtered.
2	17.3	38	—	—	44	—	—	4.8	.50	—	—	15	15	103	73	96	71
3	23.8	38	56	.50	2.5	44	5.3	1.6	4.8	.57	.45	0	15	15	103	51	90
5	23.8	37	51	.50	2.5	47	3.4	3.0	4.5	.41	100	0	15	20	103	56	90
6	23.8	37	50	.50	2.5	47	3.7	1.9	4.5	.55	.90	0	15	15	105	47	93
7	23.8	37	52	.50	2.5	50	2.2	3.2	4.3	.55	.70	0	20	20	110	64	96
8	23.7	37	50	.50	2.5	46	1.8	4.1	4.5	.52	.62	0	15	15	105	51	94
9	23.8	37	55	.50	2.5	50	2.2	3.3	4.0	.47	.55	0	15	15	103	47	97
10	23.8	37	52	.50	2.5	50	2.6	2.5	4.2	.50	.55	0	15	20	103	54	99
12	23.8	36	52	.50	2.5	53	2.3	2.8	4.2	.53	.125	0	18	20	108	72	100
13	23.6	35	56	.50	2.5	44	1.9	3.6	4.0	.47	.210	0	15	15	105	65	100
14	23.8	34	52	.50	2.5	50	1.9	3.2	4.2	.53	.125	0	18	15	106	45	96

growths in the filter bed and underdrains, as evidenced by a continually increasing bacterial count in the effluent, which finally exceeded by several times that of the raw water, despite frequent washing. This was remedied by applying bleach to the extent of five parts per million available chlorine to the wash water at every third wash. With this modification it has been possible to obtain at all times a practically sterile water without subsequent chlorination.

Until December 10, 1913, the plant was run without a mixing chamber, at a rate which gave one hour settling period. The lime was added first, followed by the iron at the mid-point of the basin. Typical results for a 10-day period are shown in Table No. 1. After December 10 the mixing chamber was installed and the rate of filtration reduced so as to give a settling period of 2½ hours, or a total of 3 hours including the mixing chamber. Under these conditions the amount of wash



PLAN AND SIDE AND END ELEVATIONS OF CLEVELAND EXPERIMENTAL FILTER PLANT.

RESULTS OBTAINED AT KIRTLAND STREET TESTING STATION. PART 2.
TABLE NO. I, OCTOBER 20TH TO 30TH, 1913.

Date.	Chemical Data.										Bacteriological Results					
	Alkalinity		Pheno.		Bl.		Carbonates		Caustic		Bacteria per cc. 37° C.		Lactose		Peptone Bile	
	Methyl Orange						Normal				Agar		Raw		Filtered	
	Raw.	Filt.	Raw.	Filt.	Raw.	Filt.	Raw.	Filt.	Raw.	Filt.	Raw.	Filt.	0.1 c.c.	1.0 c.c.	10.0 c.c.	0.1 c.c.
October 20	92	48	32	6	88	36	4	12	0	0	22	0	—	—	+	—
21	94	56	32	9	88	38	6	18	0	0	100	12	—	—	+	—
22	92	46	32	16	86	14	6	32	0	0	49	11	—	+	+	—
23	90	40	32	17	84	6	6	34	0	0	41	3	—	—	+	—
24	88	42	32	14	82	14	6	28	0	0	11	3	—	—	+	—
25	90	44	32	15	84	14	6	30	0	0	12	0	—	—	+	—
27	92	52	0	4	92	0	0	8	0	0	25	1	—	+	+	—
28	92	36	0	13	92	10	0	26	0	0	75	3	—	+	+	—
29	94	42	0	13	92	10	0	26	0	0	25	1	—	+	+	—
30	94	44	2	10	90	24	4	20	0	0	23	2	—	+	+	—

TABLE NO. II, JANUARY 2ND TO 14TH, 1914.

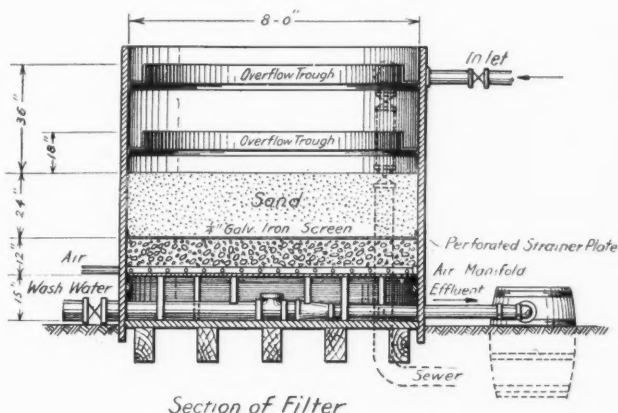
January	Alkalinity		Pheno.		Bl.		Carbonates		Caustic		Bacteria per cc. 37° C.		Lactose		Peptone Bile	
	Raw.	Filt.	Raw.	Filt.	Raw.	Filt.	Raw.	Filt.	Raw.	Filt.	Raw.	Filt.	0.1 c.c.	1.0 c.c.	10.0 c.c.	0.1 c.c.
2	88	58	0	50	88	0	0	16	0	42	34	0	—	—	+	—
3	88	36	0	12	88	12	0	24	0	0	23	0	—	—	+	—
4	90	36	0	18	90	0	0	36	0	0	59	0	—	+	+	—
5	90	32	0	17	90	0	0	30	0	2	50	4	—	+	+	—
6	90	44	0	7	90	30	0	14	0	0	39	0	—	+	+	—
7	88	36	0	11	88	14	0	22	0	0	36	0	+	—	+	—
8	88	32	0	9	88	14	0	18	0	0	23	0	—	+	+	—
9	88	34	0	10	88	14	0	20	0	0	163	12	—	—	+	—
10	90	52	0	5	90	42	0	10	0	0	—	—	—	+	+	—
11	90	40	0	8	90	24	0	16	0	0	75	25	—	—	+	—
12	90	40	0	8	90	24	0	16	0	0	75	25	—	—	+	—
13	90	40	0	8	90	24	0	16	0	0	75	25	—	—	+	—
14	88	30	0	10	88	10	0	20	0	0	52	1	—	—	—	—

water required was reduced to 2.5 to 3.5 per cent (see Table 2), as against 5 to 6 per cent in the former case. The order of applying the chemicals was changed to that described in the first part of this paper, which resulted in a slightly greater reduction in total hardness.

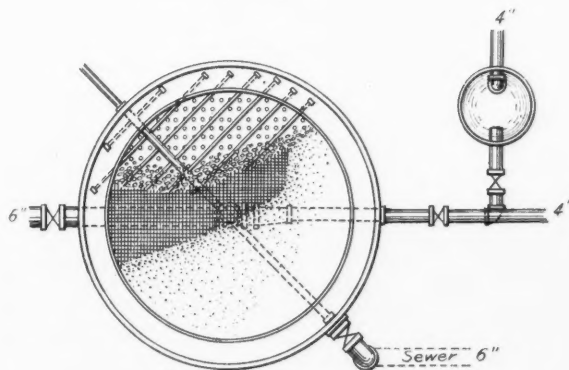
Tests to date indicate that from 4 to 4.5 grains per gallon of available CaO and 0.5 grains of iron sulphate per gallon of water are required to produce satisfactory results. The average reduction in total hardness is 50 per cent., or from 110 parts per million in the raw water to 55 in the filtrate. Using a chlorinated wash, the bacterial removal is almost complete, and coli tests in the filtrate are positive very exceptionally.

Comparative boiler tests were run, using filtered water in one boiler and raw lake water treated with boiler compound in another. The boilers were exact duplicates, being of the B. and W. water tube type, and carried equal shares of the pumping station load. The results are shown in Table No. 3. At the end of the run the boiler using raw water contained over three times as much scale as the one using filtered water. This would tend to show that with the general use of water treated and filtered as is that at the test plant, the amount of boiler compound required will be reduced to the small amount required to remove the permanent hardness constituents of the filtered water, which should result in a saving to all steam users in the city. A further economy should result from increased boiler efficiency, and consequent decreased coal consumption due to the small amount of boiler scale. This will be especially marked in small power plants where the turbinizing of boilers is often neglected until the efficiency is markedly reduced, as, with the slower rate of scale formation, the period between cleanings can be protracted unduly with less effect. The savings to steam users in coal, boiler compound, and labor, and the reduction in soap consumption seem to justify the softening treatment despite the fact that the total hardness is not excessive according to central state standards.

The preliminary tests described were conducted under direction of a commission consisting of: Prof. A. W. Smith, Case School of Applied Science; Prof. Hippolyte Gruener, Western Reserve University; Dr. R. G. Per-

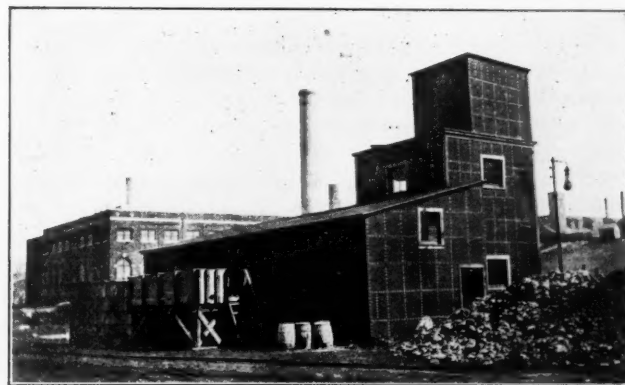


Section of Filter



Plan of Filter

PLAN AND SECTION OF EXPERIMENTAL FILTER.



BUILDING ENCLOSING EXPERIMENTAL PLANT.

filter and the rate controller. To the cock attach, by means of reducers or bushings, a three or four-inch pipe, long enough to extend to the top of the filter. A weighted hollow copper float one-half inch less in diameter than the interior of the pipe is attached by means of a fine flexible wire, running over pulleys, to a weighted pointer sliding on a scale of feet and inches and with its zero mark at the same elevation as the surface of the water in the filter. Thus, as the loss of head increases, the float will lower and the pointer rise. If there is much variation in the level of the water in the filter, a similar float and pointer is provided for it, so that the difference in head can be measured. Where the filter is not equipped with rate controllers, care must be taken when measuring the loss of head, to see that the effluent pipe is running full of water. This condition can always be obtained by partially closing the effluent valve.

It is customary at most small plants to wash the filters at regular hours regardless of the condition of the filters at such times. The writer has visited plants where the filters were, as a general rule, washed only once a week; plants where they were washed twice a day, once during the day and once at night whenever the attendant had the time or the inclination to do it, and plants where the pumping equipment was inadequate and they could wash only when the consumption of water by the town was low. Under such conditions, it is impossible to expect efficient results. The longer a filter is in operation, up to a certain point, the more efficient it becomes as a remover of bacteria, turbidity and color. But if allowed to operate too long without washing, some bacteria will be carried through the sand into the filtered water. Just after a filter has been washed its efficiency is low, as it takes a certain length of time for the sand grains to become compacted and for a slime layer to form on the surface. In some plants, after a filter is washed and put into operation again, it is allowed to filter to waste for five or ten minutes in order to bring up the average bacterial efficiency. From the foregoing statement, it is evident that the oftener a filter is washed the less efficient its average results will be. It is also evident that the oftener a filter is washed the higher the cost of operation.

It is sometimes the case that there is not enough filtering capacity to keep up with the consumption under normal operation. This condition requires more frequent washing to get the necessary amount of water through, and causes a resultant lowering in the bacterial and economic efficiency of the plant. In such cases, an effort should be made to enlarge the plant.

The washing of filters should always be done with filtered water. This is absolutely essential for good results. The writer knows of one plant that was using raw water to wash with and getting very poor bacterial reduction. On changing to filtered water, there was a marked improvement, the effluent being satisfactory from every standpoint.

In many plants, the wash water is obtained from the distribution system. Oftentimes this is the case when the pumping capacity is small and the storage limited, with the result that the washing of one filter reduces the pressure in the distribution system to an alarming extent. The variation in pressure also requires that careful attention be paid to the amount the wash water valve is opened, in order that the washing may be carried on at the same rate at all times. In many such cases it will often be found advisable to install a separate wash water pump which will deliver the required amount of water at a constant rate and will not affect the town supply. It is customary to use a centrifugal pump for

this purpose. By the use of a separate pump, the filters can be washed at the correct rate at all times and as often as necessary without waiting for a period of low consumption in the town.

The writer knows of a city having a pressure filter plant, with a limited pumping capacity, which built a concrete reservoir holding a sufficient supply of water for one day's washing. This tank was filled each night during the period of low consumption. The water used for washing was pumped from the storage tank by means of a centrifugal pump driven by a small steam turbine.

There are three general methods of washing filters, any one of which, when properly carried out with correctly designed apparatus, will give satisfactory results. The first method, which was used in most of the earlier filters and is quite commonly found in small plants, is to force water up through the underdrain system at a rate just sufficient to float the sand grains, and at the same time agitate the sand by means of mechanically operated rakes. These rakes gave the name "mechanical filter" to the general type now known as "rapid sand."

In the second method, the mechanical rakes are replaced by compressed air which is blown up through the sand either at the same time or alternately with the wash water. It was the introduction of this improvement which brought about the change in the form of construction of filters. The moving rake type of filter required that the bed be circular in shape in order that the sand could be uniformly agitated. Wooden tanks most readily adapted themselves to this type and as a result were almost universally used. With the use of air for agitation, the filters could be constructed rectangular in shape, and of concrete, thus making a plant much more compact and permanent. It also allowed the filter units to be made much larger, thus cutting down the cost of construction and operation.

In the third method of washing, water only is used, with no mechanical or air agitation, but the rate of application of the water is about twice as great as in the other methods.

In the first two methods, the rate of washing is usually about 7.5 gallons per square foot per minute. This corresponds to a rise of twelve inches per minute. The rate can easily be measured by shutting the waste valve and timing the raise of water in the filter. If the rate is less than that given above, the washing will not be efficient, for the reason that the sand grains will not be scoured clean and the upward velocity will not be sufficient to carry the heavier particles of sediment into the gutters.

With a plant equipped with mechanical rakes, the process of washing is as follows: The filter is cut out of operation and the waste valve opened, thus draining the gutters. The wash water is now turned on and after it has loosened the sand the rakes can be started. This process should be carried on until the water is fairly clear. It is not necessary or advisable that the final waste wash water be as clear as the filtered water, as this would greatly increase the amount of wash water needed and would lower the bacterial efficiency. It may be found convenient to have a few wide-mouthed bottles in which samples of the waste water can be taken at intervals during the washing to determine the proper length of wash. It is not believed to be good practice to drain the water entirely out of the filter before washing. The inflow should be cut off and the water in the filter allowed to settle to the level of the gutters and the washing process then started. If the filter is drained, enough extra wash water is needed to fill the filter to the gutter level, and it is much more economical to allow this water to flow in from the coagulation

basin than to pump it from the clear well. With many waters a heavy foam is caused during washing. This is found to be much more abundant when the water is drained below the sand surface before washing. The writer can see no special disadvantage or harm in this foam, but it usually causes the attendant much worry. It can be eliminated by spraying with water from a hose while the washing is taking place.

Where air is used for agitation, there are several methods of operation. Some authorities favor the simultaneous application of water and air while others advocate the application of the air followed by the water. In some plants the air and water are both applied through the same strainer system and in such cases the former method cannot be used. In the simultaneous method, the wash water is turned on, which loosens and lifts the sand, and the air is then applied, thoroughly scouring the sand grains. The advocates of this method claim that more uniform distribution of the air is obtained than by alternate air and water. In the other method, the filter is drawn down until only a few inches of water remain above the sand. The air is now turned on at the rate of about four cubic feet per square foot of filter surface at a pressure of five pounds per square inch, and allowed to blow for about three minutes. The wash water is then started and the air cut off, it usually requiring from six to ten minutes' flow of water to wash the filter. Another method is to drain all of the water out of the filter, turn on the air and, after it has run a few seconds, allow a few inches of raw water to flow over the surface of the sand. After about three minutes' agitation, the air is cut off and the wash water started. It is claimed that this method gives good distribution of the air and prevents hard spots forming in the bed.

In the writer's opinion, it is impossible to say off-hand which method of washing is the best, as some waters respond to one method and some to another. Every man in charge of a plant should test out all of the possible methods of washing, trying the different schemes on different filters at the same time and keeping a record of the length of time between washings and the amount of wash water used, in order to determine which is the most economical for the case in hand.

In the air wash system, great attention should be paid to the uniformity of the air distribution. If it is seen that one part of the bed is getting the air in greater quantities than the remainder, it probably indicates that something is wrong. The writer has one case in mind where this condition was found. It had seemingly been going on for some time, with the result that the filter was never properly washed and the sand had become, in spots, very hard and compact and contained balls of mud. The water that managed to get through the filters was high in bacteria and showed but little purification. Upon removing the sand, it was found to contain large amounts of muddy sediment throughout its entire depth. An inspection of the air distribution system disclosed the fact that several of the lateral pipes were broken off and that most of the others were clogged with sand, thus making the whole system practically useless. Upon replacing the air pipes and putting in new sand, the filter operated at its normal rate with satisfactory results.

It is sometimes found in those filters having the concrete ridge block strainer system and a screen for holding down the gravel, that one or more of the bolts holding the strainer plates in place breaks. When this happens the screen is usually torn and the gravel and sand mix, with the result that the washing is uneven and that the underdrain system becomes clogged with sand. The only remedy in such cases is to remove the sand and

repair the broken strainer. Such a condition usually makes itself evident during washing by increased agitation directly above the point of break.

(To be continued.)

STREET LIGHTS AND POLES

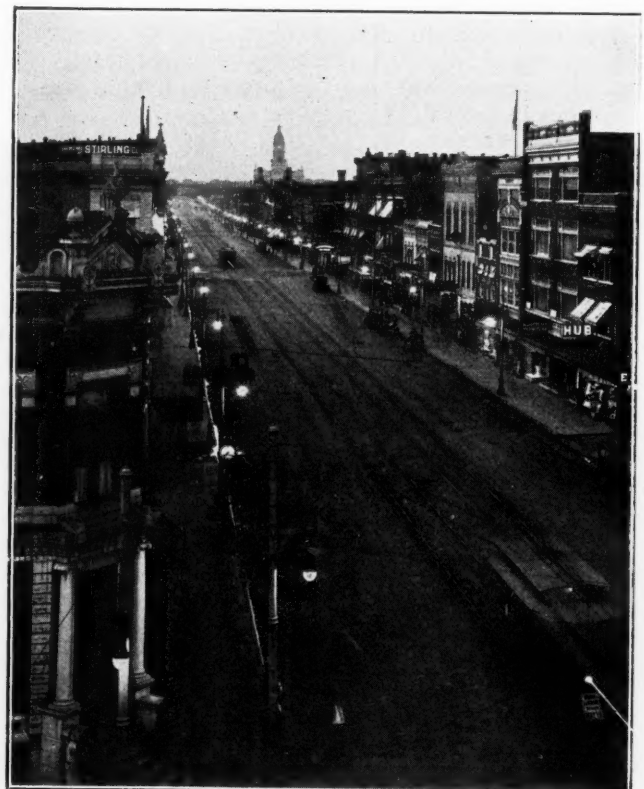
Development of Lighting Standards—Special Designs for Different Districts—Ornamental Poles—Combined Light, Trolley and Fire

Alarm Supports

By K. G. MARTIN.

The development of street lighting units has been more than adequately covered in many interesting and authoritative articles, and we frequently find in city planning and similar expositions exhibits which show that the earliest fixtures were merely torches thrust into a cranny of a wall and from these crude, first lights, graduated successively the burning fagots, the old lantern with its candle, the first oil lamps, then the first gas lights glimmering through the fogs of London, then the coming of the Wellsbach mantle, and, finally, the arc and incandescent lamps that were the forerunners of the lighting units which we know and use to-day and which will be known and used for years to come.

With this gradual development of the source of illumination, has come as gradually, but nevertheless surely, a most encouraging growth in the fixture or setting for the light, the means by which it was suspended, supported or displayed. From the old and ugly gas lamp posts of our youth, we have come to demand lighting standards and fixtures for our city streets and the outside adornment of buildings which are harmonious in outline and portray a keen appreciation of all that is good and proper in design, preparation and workmanship. It is not, of course, true that we find these perfect examples everywhere, but there are few cities to-day in-



LAMPS ON TROLLEY POLES, MAIN STREET, WICHITA, KAN.

stalling posts that are not acceptable to those of even the most highly developed artistic temperaments. We have not reached a limit by any means; we are merely at a certain stage of our growth, but it is a good sign and a guarantee for the future that we have even now come to insist upon what we, in this day at least, consider to be artistically designed lamp posts.

The incandescent lamps and highly ornamental poles with which they are used have produced in many of our cities a most beautiful effect and the tendency at this time is no doubt toward the general adoption of this means of lighting our city streets. We have witnessed within the last three years the startling and wonderful growth of what is popularly termed "Great White Ways," and in time to come this movement will undoubtedly be given a prominent place in recording the commercial growth and upbuilding of the cities in this country. Cities to-day have to go after residents and manufactories upon a business basis and the greatest possible aid that can be given their natural advantages is the brilliant lighting of their streets, attracting not only permanent residents but the great number of transient visitors that means so much to the prosperity of any community.

The factors involved in the installation of a "Great White Way" in any community are three in number. They are the citizens, considered both individually and collectively as represented in their councils and government, the central station supplying the energy, and the manufacturers of the cast iron poles and incandescent lamps. These three factors must work together for the enhancing of the value of the city, and while there are many minor details to be taken care of, there are no impediments which should not be readily overcome. The manufacturers of the lighting equipment and the central station people are only too ready to do their share of the work and supply expert assistance, prepare plans and offer suggestions and the great commercial bodies and associations representing the three factors mentioned have accumulated a vast amount of data which can be consulted by the proper authorities.

It has been found desirable in the consideration of a plan for improved city lighting to give special consideration to the particular needs of the various sections of the community. Thus, the commercial or busi-

ness section will require a particular kind of pole and lamp; the resident section will require another, and the suburbs will require still another. The first section is usually sub-divisible into two commercial branches, viz.: the retail business and the wholesale business sections. In the wholesale business section and in the outlying suburban districts the arc lamp offers an excellent means

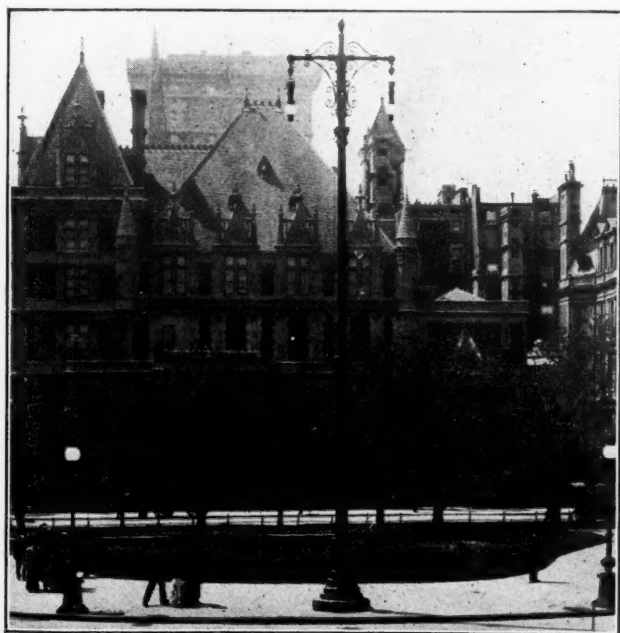
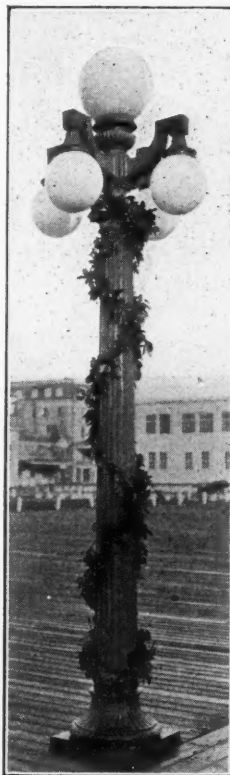
of illumination. The wider spacing of the arc lamps tends, in the congested commercial district, to lessen the chance of injury to the pole by trucks, and as in the case of suburban districts tends to distribute lights over large areas with entirely adequate intensities. In the retail business and closely built up residential sections, incandescent lamps, carried in groups on ornamental cast iron poles, would seem to be supreme. This system offers much in the way of decoration and adornment and we have gradually seen the elimination of the arched lighting fixtures which spanned the entire street, of the arc lamp, and of the incandescent gas lamp, from these districts.

Some cities have gone a step in advance and have placed special containers at the tops of the poles to carry plants, flowers and trailing vines. This produces a very beautiful effect and adds much to the attractiveness of the daylight hours of the posts. On special occasions, such as parades or conventions, the posts which are not thus equipped can be twined with garlands and

ASBURY PARK, N. J.
Post twined with vines.

festoons hung between the poles which are spaced sufficiently close to make this possible.

With the coming of the ornamental post for incandescent lighting, it was feared for a time that the great number of poles which were thus used would tend to clutter up the street with obstacles and in the daytime be especially obnoxious. The manufacturers of the poles, however, have proved themselves able to make their product attractive and ornamental so that there are few streets to which these modern units have been applied that have not benefited greatly in their appearance by their adoption. Besides this point, however, the manufacturers have succeeded in having the cities allow them to place combination fixtures on their streets which embody in the same unit the lighting standard, fire alarm or letter box and the support for any overhead trolley lines which may exist. Some difficulty has been experienced with various cities in getting this done, but the opposition encountered has been due to a lack of technical knowledge on the part of city interests involved which has been gradually overcome. We can look forward with confidence to the time in the near future when all our cities that work toward progressiveness will have their thoroughfares equipped with lighting standards which will be both beautiful by day and efficient at night and there will be many rewards reaped by these cities aside from those which have been indicated above, because the coming of light and its use, upon a really adequate scale, will relegate to the past many of the unfortunate conditions which are only too prevalent to-day.



Courtesy New York Edison Company.

LIGHT STANDARDS IN FRONT OF VANDERBILT'S RESIDENCE, NEW YORK.

WATER WORKS STATISTICS

Figures Furnished to Us for This Purpose by the Superintendents of Seventy-Eight Additional Water Works Plants, Both Municipal and Private—Data Received Since the Publication of Similar Tables in the Issue of May 7.

TABLE NO. 2.—CONSUMPTION AND GENERAL—PRIVATE.

City.	Cost of plant.	Population		Consumption.			Passed through meters, gallons.	Furnished Free.	
		Total.	Supplied with water.	Total gallons.	Maximum daily gallons.	Method of obtaining figures.		Gallons.	Method of obtaining.
Connecticut:									
Stonington and Groton.....		8,000	5,000	188,385,327	516,124	Pump counter	.....	3 fountains	.....
Iowa:									
Burlington.....	\$700,000	25,000	....	820,144,557	4,900,000	Venturi meter	322,078,533	.....	.....
Kansas:									
Atchison.....	415,000	15,000	12,000	540,000,000	2,500,000	Pump counter	220,000,000	50,000,000	Estimated
Kentucky:									
Paris.....		6,000	4,000	24,000,000	80,000	.....	.....	100,000	Estimated
New Jersey:									
West Orange.....		11,500	11,000	304,270,000	1,057,000	Metered	244,415,899	None	.....
New York:									
Canistota.....		2,500	2,000	.....	200,000	Estimated	.....	2,500,000	Estimated
Norwich.....		7,400	6,800	.....	.....	.....	.....	.....	.....
North Carolina:									
Oxford.....	74,478	5,000	3,000	27,050,737	.....	Meter & estimate	.....	Schools	.....
Ohio:									
Massillon.....		15,000	14,700	326,677,475	1,258,350	Pump counter	90,722,469	27,441,371	Measured & estimated
Pennsylvania:									
Chester.....		65,000	55,000	1,350,000,000	5,000,000	Meter & estimate	675,000,000	50,000,000	Estimated
Texas:									
Laredo.....	224,288	15,000	7,000	308,000,000	....	Meter & estimate	91,250,000	127,750,000	Estimated

TABLE NO. 6.—METERS AND RATES—PRIVATE.

City.	Kind of fire connections.	Service Meters		Do Consumers Own Maintain meters?		Cost per year of main-tenance, etc.	Reduction in consumption.	Meter Maxi-mum.	Rates Mini-mum.		Rates for private fire service.
		No. added during year.	No. now in use.	Own	Maintain						
Connecticut:											
Stonington & Groton.....	National, Crown	1	37	No	No	...	Yes	\$0.25	\$0.16	....	....
Iowa:											
Burlington.....	None	0	200	No	No	...	...	.25	.10		\$24.00
Kansas:											
Atchison.....	None	50	370	No	No	...	Yes	.30	.05	....	....
Kentucky:											
Paris.....	None	1	40	No	No	...	...	.25	.15		30.00
New Jersey:											
West Orange.....	Trident Crest	121	1,836	Optional	No	...	...	..	..	..	..
New York:											
Canistota.....	None	..	..	Yes	Yes	...	Yes	.30	.07½		12.50
Norwich.....	.....	0	15	No	No	...	...	..	..	....	....
North Carolina:											
Oxford.....	None	50	315	No	No	...	Yes	.30	..		40.00
Ohio:											
Massillon.....	None	191	1,111	No	No	...	...	.20	.12	..	..
Pennsylvania:											
Chester.....	Hersey detector, 70 Neptune compound		2,010	No	No	\$3.97	....	.30	.04		40.00
Texas:											
Laredo.....	None	0	300	No	No	...	...	.16%	..	..	..

TABLE NO. 8.—TREATMENT OF WATER—PRIVATE.

City.	Sand Filters		Sediment-ation.	Softening plant.	Treatment for algae.		Hypochlorite.	Other Treatment.
	Slow.	Rapid.			algae.	Hypochlorite.		
Connecticut:								
Stonington & Groton.....	...	...	Yes	...	Yes	Yes	.....	.....
Iowa:								
Burlington.....	...	Yes	Yes	...	...	...	Aluminum sulphate	.....
Kansas:								
Atchison.....	...	...	Yes	...	...	Yes	Aluminum sulphate	.....
Kentucky:								
Paris.....	Yes	...	Yes	...	Yes	...	.....	.....
New York:								
Canistota.....	...	Yes	...	...	...	...	.....	.....
Norwich.....	...	Yes	...	Yes	Yes	...	.....	.....
North Carolina:								
Oxford.....	...	...	...	...	Copper sulphate	...	.....	.....
Pennsylvania:								
Chester.....	...	Yes	Yes	Yes
Texas:								
Laredo.....	...	Yes	Yes	...	Yes	Yes

Continued on page 938

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Subscribers desiring information concerning municipal matters are requested to call upon MUNICIPAL JOURNAL, which has unusual facilities for furnishing the same, and will do so gladly and without cost.

JUNE 25, 1914.

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FIRE HYDRANT RATES.

In the water works tables in the issue of May 7, and the supplementary tables in this issue, will be found the meter rates for most of the cities listed therein, and also the rates for private fire service in a large majority of them, but no fire hydrant rates are given. We are continually receiving requests for fire hydrant rates, apparently to be used as a basis for making or adjusting rates in other cities, and while we have frequently expressed our ideas on this subject, it seems necessary to repeat them at intervals.

As a matter of fact, a fire hydrant rate, so called, is not properly a fire hydrant rate at all, and as either fire hydrant rate or any other kind of a rate it has absolutely no meaning or significance in the majority of cases, except that it tells how much a given city is paying to a private company or a municipal department under this item. Indeed, we expect before very many years to find both the thing and the name of fire hydrant rate to have generally disappeared and been supplanted by a more logical basis of payment.

A company which obtains a franchise for supplying a city with water generally makes an agreement to furnish fire protection as a public service, for which it is

to be paid by the city, this payment being generally termed "hydrant rental" or "hydrant rate," and based upon the number of fire hydrants. But it must be noted that what the city purchases and what the company furnishes is not fire hydrants, but the fire protection which is furnished by a combination of hydrants, mains and the water which passes through them, including the reservoirs, pumps, filters, etc., which are installed and operated in connection with the water supply. The hydrant is a small, and perhaps the least important, feature of the fire protection system, and to make it the basis of payment is illogical and unscientific. It is conceivable that Company A may furnish twice as effective fire protection in one city as Company B does in another, and yet Company B, by furnishing more fire hydrants, may secure a higher fire protection payment in the form of hydrant rental. There is every reason why both the company and the city should prefer a fire protection payment based upon the general service furnished, rather than upon the number of fire hydrants. The company would then receive equitable compensation for supplying pumping and distribution systems which are adequate to meet the requirements; while, on the other hand, the city can increase the number of fire hydrants to that which will give the most complete protection, with no additional cost but the capital and maintenance charges for the hydrants themselves. In fact, in a few cases the cities themselves pay for and own the fire hydrants, although the companies own all other parts of the system.

Several cities have already adopted a system of paying for fire protection on the basis of the distribution system, rather than the fire hydrants, which system was described by John W. Alvord last week. This may not be the best system devisable in all its details, and further experience with it may suggest modifications, but it is at least based upon scientific principles, and the rates mean something; and we expect to see this system, or a modification of it, gradually spread into a large proportion of the progressive cities of the country.

The objection to the present system of hydrant rentals, however, is not only, or even chiefly, that the hydrant is an illogical basis of payment, but because the rates themselves have generally no relation to the service rendered. A few years ago we published a long list of hydrant rentals, in which it was shown that these varied all the way from \$1 to \$100 per hydrant, and there was to be found no reason for these variations, except in a few cases. There is no reason why there should be, for in the majority of cases the rates were not based upon any business principles, or even upon any calculation, however elementary, but were merely a compromise between the company and the city upon what one was willing to pay and the other was able to obtain. Only within the last few years have students of water works finances and finances of public utilities generally made a thorough study of the subject, and arrived at a more or less definite conclusion as to how much a company or department is entitled to from a city for the fire protection which it supplies, as distinct from the water supplied for other purposes.

From the above it must be evident that a list of fire hydrant rates could serve no useful purpose, except to permit certain parties to decide upon a rate without the bother of exercising their gray matter, or to serve as arguments on one or the other side of a dispute concerning rates which is based upon false and illogical assumptions, and might better be entirely abandoned or renewed from a totally different standpoint.

TABLE NO. 1—CONSUMPTION AND GENERAL MUNICIPAL.
Consumption.

City.	Cost of plant.	Population.		Total gallons.	Maximum daily gallons.	Method of obtaining figures.	Consumption.		Furnished free.	
		Total	Supplied with water.				Passed through meters, gallons.	Gallons.	Method of obtaining.	
Arkansas:										
Batesville	\$55,000	4,000	2,000	49,194,120	200,000	Pump counter	32,500,000	15,000,000	Estimated	
Ft. Smith	560,000	33,000	4,000	922,952,900	2,528,638	.....	70,785,200 in 3 mo.	.....	.....
Delaware:										
Wilmington	3,078,560	32,000	32,100	4,169,661,400	.....	.....	2,329,824,750	68,200,000	Mostly metered	
Florida:										
St. Augustine	100,000	6,000	1,100	200,000,000	600,000	Pumps	.....	.....	.....
Georgia:										
Athens	219,649	20,000	.....	378,955,000	.....	Meters	.....	.....	Estimated	
Dublin .....	.....	4,000	.....	131,323,600	.....	.....	.....	.....	.....
Fort Valley .....	.....	3,000	2,000	54,000,000	150,000	Estimated	.....	.....	.....
Illinois:										
Bloomington .....	.....	30,000	22,000	600,000,000	2,500,000	Pump counter	.....	.....	.....
Kewanee	60,000	16,000	6,000	100,000,000	400,000	Estimated	65,000,000	35,000,000	Estimated	
Mattoon	133,000	14,000	.....	270,000,000	1,000,000	Meter	270,000,000	.....	.....
Wheaton .....	.....	4,000	.....	89,995,000	265,000	Venturi meters	.....	.....	.....
Indiana:										
Brazil	170,000	11,000	.....	218,443,773	500,000	Pump strokes	105,342,656	56,327,624	Estimated	
Iowa:										
Ames	75,000	5,000	5,000	.....	.....	Meters	.....	.....	.....
Newton	85,000	5,000	3,000	.....	150,000	.....	150,000	.....	.....
Kansas:										
Hiawatha .....	.....	3,500	2,500	61,014,000	250,000	Meters	40,850,000	10,000,000	Estimated	
McPherson	50,000	4,000	.....	84,408,000	.....	Meters	84,408,000	41,760,000	Measured	
Winfield	164,000	8,000	7,000	500,546,000	3,500,000	Meters	.....	.....	.....
Maine:										
Bangor .....	.....	2,500	2,000	1,390,712,800	.....	.....	.....	None	.....
Farmington	103,974,40	.....	.....	.....	.....	.....	.....	.....	.....
Massachusetts:										
Chicopee .....	.....	.....	.....	615,379,941	.....	Venturi meter	.....	.....	.....
Clinton .....	.....	37,000	.....	260,285,000	.....	.....	.....	.....	.....
Fitchburg	1,301,948	47,500	43,850	2,188,783,874	.....	.....	385,996,500	.....	{ Schools, public build- ings, cemeteries, foun- tains, etc.	
Haverhill	1,649,707	.....	.....	.....	.....	.....	.....	.....	.....
Leominster	649,014	41,000	41,700	1,054,453,870	.....	.....	625,000,000	.....	.....
Newton	2,481,030	20,443	20,700	504,561,500	167,248	Meters	26,426,174	None	.....
Revere	484,148	5,678	3,960	59,861,184	.....	.....	.....	.....	.....
Winchendon	187,013,19	.....	.....	.....	.....	.....	.....	.....	.....
Michigan:										
Kalamazoo	700,000	45,000	22,500	836,740,000	3,046,400	Pump counter	.....	502,044,000	Estimated	
Muskegon	1,000,000	30,000	1,200	1,543,326,465	4,227,469	.....	.....	383,331,000	.....
Niles	720,000	6,000	1,200	208,460,344	800,000	.....	300	.....	Estimated	
Norway	113,000	4,985	.....	127,750,000	720,000	Venturi meter	.....	.....	.....
Detroit	12,637,345	475,000	604,906	38,540,022,872	.....	.....	14,883,772,975	.....	.....
Minnesota:										
Pilestone .....	.....	2,900	2,000	27,432,527	70,000	Pump counter	.....	219,000	Estimated	
Missouri:										
Brookfield	43,000	6,700	500	26,563,728	73,772	Estimated	1,304,197	23,000	Measured	
St. Louis	28,169,751.70	730,000	730,000	33,884,000,000	120,116,000	Ven. m. & p. counter	8,550,000,000	3,000,000,000	Estimated	
Trenton	90,000,000	7,000	3,000	200,000,000	600,000	Estimated	14,000,000	11,000,000	Estimated	
Montana:										
Havre	118,743.68	5,000	5,000	.....	450,000	Estimated	42,000,000	10,000,000	Estimated	
Helena	500,000	15,000	15,000	.....	3,500,000	.....	1,000,000	.....	.....
Nebraska:										
Chadron	127,000	2,869	2,869	45,000,000	560,000	Meters	23,000,000	1,000,000	Estimated	
Lincoln	953,344	50,000	.....	1,138,570,000	.....	Pump counter	.....	512,356,500	Estimated	
New Hampshire:										
Somersworth .....	.....	7,000	5,950	172,364,741	514,944	Pump counter	.....	.....	.....

[illegible]

TABLE NO. 3.—DISTRIBUTION SYSTEMS—MUNICIPAL.

City.	Street Mains—		Now in service, miles,	Hydrants in service.	Stop gates in service.	Sprinkling in cart appliances.	Service Connections—		Motor and Elevator—		Private Fire—	
	Laid during year, feet.	Discontinued during year, feet.					Added during year.	Now in service.	Added during year.	Discontinued during year.	Number in use.	Sizes.
Arkansas:												
Batesville .....	....	....	4.1	35	10	1	43	437	None	None	5	2
Fort Smith .....	....	....	55	339	....	3 cranes	...	3,877	.....	.....	..	..
Delaware:												
Wilmington	7,152	....	134.9	937	....	.....	578	19,909	.....	.....	..	..
Florida:												
St. Augustine... ..	....	....	....	136	125	None	53	1,100	.....	.....	25	2 to 6
Georgia:												
Athens	6,000	0	24	263	...	0	80	1,800	0	0	23	6
Fort Valley.....	0	0	5	40	15	.....	24	275	0	0	10	2
Illinois:												
Bloomington ...	26,000	3,000	63	615	365	9	311	5,387	0	0	9	6
Kewanee	12,517	0	21	247	196	.....	84	1,100	0	0	..	..
Mattoon .....	....	....	...	0	45	.....	123	900	.....	.....	2	4
Wheaton .....	....	....	30	250	100	.....	45	900	.....	.....	..	..

TABLE NO. 3.—DISTRIBUTION SYSTEMS—MUNICIPAL—(continued).

City.	Laid during year, feet.	Street Mains Materials.	Discontinued during year, feet.	Now in service, miles.	Hydrants in service.	Stop gates in service.	Sprinkling in cart appliances.	Service Connections— Added during year.	Now in Service.	Motor and Elevator— Connections, Added during year.	Discontinued during year.	Private Fire— Connections.	
												Number in use.	Sizes.
Indiana:													
Brazil	.....	.....	.....	.....	136	.....	.....	.....	875	.....	.....	.....	.....
Iowa:													
Ames	800	C. I.	0	12	80	21	3	120	725	.....	.....	.....	.....
Newton	5,280	C. I.	.....	15	95	.....	2	175	1,000	.....	.....	5	.....
Kansas:													
Hiawatha	5,000	C. I.	.....	10	48	63	1	34	600	0	0	0	.....
McPherson	100	C. I.	0	10	76	41	.....	30	780	0	0	.....	.....
Winfield	6,000	C. I.	.....	30	183	221	0	125	1,563	.....	.....	.....	.....
Maine:													
Bangor	6,292	.....	.....	53.7	309	25	27	84	5,068	.....	.....	.....	.....
Farmington	0	.....	0	0	50	.....	5	19	524	0	0	3	.....
Massachusetts:													
Chicopee	10,303	C. I.	.....	61.8	323	.....	24	122	.....	.....	.....	.....	.....
Clinton	1,093	.....	.....	37.1	191	.....	.....	15	2,004	.....	.....	.....	.....
Fitchburg	7,240	.....	.....	82.25	620	.....	.....	124	5,572	.....	.....	.....	.....
Haverhill	19,763	C. I. & Mt Ind.	0	105.53	401	1,328	53	271	7,324	0	.....	.....	.....
Leominster	3,556	.....	.....	57.79	398	.....	.....	60	3,165	.....	.....	.....	.....
Newton	15,745	C. I.	1,414	152.4	1,032	939	78	199	8,736	0	.....	.....	.....
Revere	11,680	.....	.....	52.6	250	.....	24	.....	.....	.....	.....	.....	.....
Winchendon	2,666	C. I. & steel	0	13.41	180	238	7	29	877	0	0	14	6 and 8
Michigan:													
Detroit	314,072	.....	23,223	876.5	6,933	9,855	.....	.....	.....	.....	.....	.....	.....
Kalamazoo	36,390	C. I.	.....	55.75	739	1,709	0	.....	.....	0	0	12	4 and 6
Muskegon	2,479	.....	.....	.....	197	381	0	300	5,000	0	0	.....	.....
Niles	4,000	.....	0	28.0	186	400	6	2	6	2	0	10	2 to 6
Norway	1,100	C. I.	0	18	107	142	2 cranes	48	850	1	12	0	.....
Minnesota:													
Papstone	2,180	C. I.	0	5	53	39	0	41	482	0	0	6	2
Missouri:													
Brookfield	10,000	C. I.	0	10.5	66	30	1 crane	50	500	0	0	0	.....
St. Louis	95,568	C. I.	1,438	964.4	11,325	12,107	1,766	2,538	112,162	.....	.....	525	3 to 12
Trenton	2,000	C. I.	.....	13	88	33	0	100	750	.....	.....	.....	.....
Montana:													
Hayre	8,000	C. I. & steel	2,000 (wood)	9.75	80	126	2	43	515	1	0	4	4
Helena	37,000	Mathison	0	72	297	412	.....	30	3,100	0	0	6	3 to 6
Nebraska:													
Chadron	1,500	C. I.	0	.....	40	0	0	30	520	0	0	0	.....
Lincoln	22,260	C. I.	.....	83	692	646	.....	647	9,368	.....	.....	.....	.....
New Hampshire:													
Somersworth	0	.....	0	.....	93	76	5 standpipes	5	963	0	0	4	6
New Jersey:													
Rahway	10,920	C. I. & W. I.	0	23.75	188	231	0	119	1,913	0	.....	5	3 to 6
New York:													
Albany	41,290	C. I.	10,771	151.26	1,185	1,291	0	514	18,428	2	4	79	3 to 6
Buffalo	39,670	C. I.	2,056	511.3	5,103	10,367	0	1,757	81,066	0	0	189	2 to 6
Johnstown	5,488	C. I.	0	27.75	192	346	0	51	2,280	0	0	3	4
Saranac Lake	1,906	Universal	0	22	160	340	.....	9	9	2	1	20	2 to 4
Schenectady	41,000	C. I.	.....	105	1,436	2,565	75	1,001	13,000	.....	.....	50	4
Watertown	.....	.....	0	59	200a	400a	0	25a	6,500a	2	.....	25a	4 to 6
White Plains	2,300	C. I.	0	42	403	422	0	114	3,262	0	1	0	.....
North Carolina:													
Raleigh	36,375	C. I.	.....	32.5	252	252	0	381	3,387	0	.....	57	4 to 6
Ohio:													
Cleveland	129,351	C. I.	11,379	858	10,387	19,357	152	4,201	90,275	1	11	448	1 1/2 to 10
Middletown	1,500	C. I.	.....	25	275	.....	2	288	3,200	.....	0	15	4 to 6
Wellington	600	C. I.	0	.....	48	34	.....	10	200	0	.....	3	2 to 4

TABLE NO. 5—METERS AND RATES. MUNICIPAL.

[illegible]

TABLE No. 5.—METERS AND RATES. MUNICIPAL.—Continued.

City.	Kind on fire connections.	Service No. added during year.	Meters No. now in use.	Do Consumers		Cost per year of maintenance etc. consumption.	Reduction in consumption.	Meter Rates—Cents per 1,000 gals.		Rates for private fire connections.
				Own meters	Maintain meters.			Maximum.	Minimum.	
Michigan:										
Detroit	Hersey detector	2,495	13,302	Yes	Yes	.96	....	5%	3	\$100 to \$25
Kalamazoo	Hersey detector	200	....	332	No	Yes	Yes	10%	6	....
Muskegon	Hersey detector	10	300	20	No	\$100	....	10%	6	\$30
Niles	Hersey detector	3	138	No	No	....	....	30	10	....
Norway	None									
Minnesota:										
Pipestone	Pittsburg, National, Standard	39	471	Yes	Yes	....	Yes	60	30	....
Missouri:										
Brookfield	None	50	800	Yes	No	....	Nearly half	50	25	None
St. Louis	Hersey detector	215	7,371	40%	Yes	....	Yes	20	8	No charge
Trenton	Hersey detector	50	325	No	No	\$1.00	Yes	40	8	....
Montana:										
Hayre	Crown disc	7	35	No	No	....	Yes	30	15	....
Helena	None	10	250	Yes	No	....	....	40	15	....
Nebraska:										
Chadron	None	12b	493b	No	No	....	Yes	12	9	....
Lincoln	None	565	8,601	....	....	....	....	....	....	....
New Hampshire:										
Somersworth	None	25	308	No	No	....	Yes	30	20	....
New Jersey:										
Rahway	Detector	0	180	Part	Yes	....	Yes	20	5%	Free
New York:										
Albany	None	609	5,756	No	No	1.10	Yes	8	5	....
Buffalo	None	302	4,004	No	No	1.00	....	6	2	\$24
Johnstown	None	6	231	No	No	....	....	26%	3%	....
Saranac Lake	None	None	None	No	No	....	....	5%	....	....
Schenectady	None	300	500	No	Owners	....	Yes	....	....	....
Watertown	Hersey detector	25b	704	No	No	.48	....	26%	16	....
White Plains	None	125	3,207	No	No	....	....	....	....	....
North Carolina:										
Raleigh	None	94	864	33%	No	....	Yes	25	7	\$20 to \$40
Ohio:										
Cleveland	Hersey detector	3,206	87,282	No	No	.398	....	13%	6%	Free
Middletown	None	302	1,800	Part	No	.30	....	25	10	....
Wellington	None	15	200	No	No	....	....	....	....	....
Oklahoma:										
Chandler	Keystone	150	167	No	No	....	50%	13%	6%	\$25
Pennsylvania:										
Homestead	None	18	300	Yes	Yes	....	....	25	8	....
Sewickley	Crown	4	100	No	No	.50	....	....	....	\$25
South Carolina:										
Florence	None	97	....	....	....	....	....	20	10	....
Greenwood	None	....	....	....	....	....	....	....	....	....
Texas:										
Sherman	Hersey detector	150	2,600	Partly	Owners	.60	....	50	20	....
Vermont:										
St. Albans	None	76	....	....	....	....	....	....	....	....
Virginia:										
Richmond	Hersey detector	1,821	16,874	Part	No	....	Yes	10	2	....
Winchester	None	....	8	Yes	No	....	....	....	....	....
West Virginia:										
Parkersburg	None	200	1,800	No	No..	1.00	Yes	10%	6%	Free
Wisconsin:										
Watertown	None	55	1,238	50b	No	.20	....	25	6	....
West Allis	None	175	1,300	Yes	Yes	.10	Yes	....	....	....
Canada:										
Lethbridge, Alta.	None	31	71	Few	Owners	....	....	40	10	....

*\$25 minimum yearly, or consumer furnishes meter and pays 50 cents a month. b Approximate. c Meter rents, 75 cents, minimum rate for three months, \$1. d No meter rates for domestic use.

TABLE NO. 4—DISTRIBUTION SYSTEM—PRIVATE.

TABLE NO. 4—DISTRIBUTION SYSTEM—PRIVATE.											
City.	Laid during year, feet.	Street Mains		Hydrants in service.	Stop gates in service.	Sprinkling in appliances.	Service Connections Added during year.	Now in service.	Motor & Elevator Connections. Added during year.	Private Fire Connections.	
		Materials.	Discontinued during year, feet.							Number in use.	Sizes.
Connecticut:											
Stonington & Groton.....	2,000	C. I.	0	122	...	0	23	1,216	0	13	6
Iowa:											
Burlington	10,877	C. I.	..	484	636	3	261	4,445	0	13	6
Kansas:											
Atchison .....	....	....	0	178	...	2	..	2,400	0	5	4 & 6
Kentucky:											
Paris	1,500	C. I.	0	116	100	0	40	1,100	0	3	4
New Jersey:											
West Orange	9,260	C. I. & Univ.	0	272	160	0	135	1,937	0	2	2 & 4
New York:											
Canistota	392	W. I.	0	60	33	1	32	540	0	4	2 to 4
Norwich .....	....	....	1,333	62	...	..	43	2,063	..	6	4 to 6
North Carolina:											
Oxford	1,000	W. I.	0	64	22	2	52	385	0	..	..
Ohio:											
Massillon	382	C. I.	0	310	225	3 standpipes	90	3,000a	0	9	2 to 6
Pennsylvania:											
Chester	44,000	C. I. & W. I.	0	240	500	..	582	9,975	1	54	6
Texas:											
Laredo	0	C. I. & W. I.	0	137	75a	0	..	1,450	0	0	..
a—Approximate.											

a—Approximate.

WATER PURIFICATION PLANTS.

The tables on the preceding pages contain the figures from eighty-six municipal and private water works plants which were received too late to be included in the tables published on May 7. These bring the number of plants represented up to almost six hundred.

Of these, 151 or more than one-fourth purify the water in one or more ways. The list of these is excluded this week by lack of space, but will be published later. This list will show that 38 have slow sand filters; 52 have rapid sand filters; 74 employ sedimentation, 42 in combination with filtration; 16 have softening plants; 31 treat for algae more or less frequently, while two have covered their reservoirs to prevent their growth, and another says the softening process removes them. Hypochlorite is reported used by 57, while 9 use liquid chlorine. Aeration is employed by 6 cities. As to the coagulant used, 26 report aluminum sulphate and 10 use iron sulphate.

Of the 45 plants in New Jersey serving 161 municipalities, rapid sand filters are used by 30 and slow sand by 3. Twenty use hypochlorite.

IMPROVED WATER SUPPLY OF DALLAS

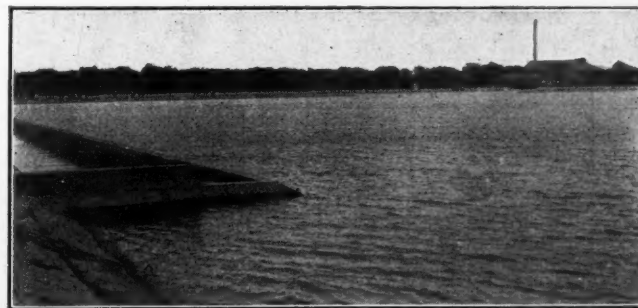
Increase in Quantity by Impounding Streams and by Wells—Purification by Rapid Filters and Hypochlorite, and Softening

By HUNT McCaleb.

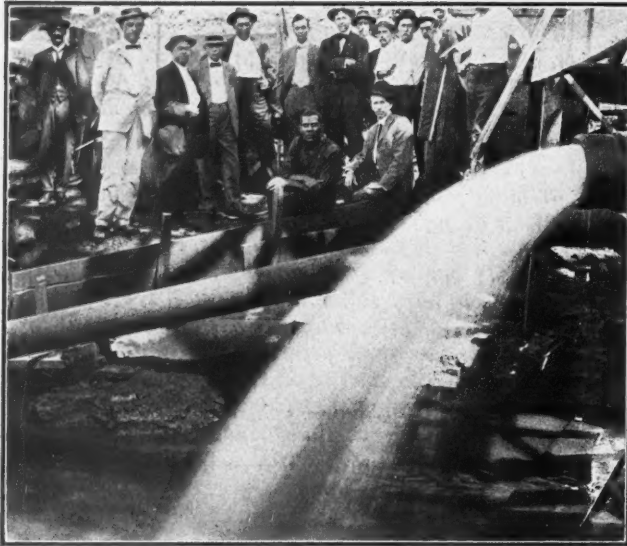
The greatest problem which confronts the average inland city is that of a pure and abundant water supply. This fact was brought home to Dallas, Texas, four years ago when, as a result of a long continued drouth in the Dallas section, the water system failed and the city found itself guarding its limited supply and restricting its use until a bath was the greatest luxury the city afforded. The seriousness of the situation was so great that energetic and drastic measures were proposed. The business interests of the city, combined with practically every private interest and private citizen, demanded relief—and they got it.

The result is the reservoir at White Rock, which impounds seven billion gallons, and other dams across the Elm Fork of Trinity river, which impound other billions of gallons. In addition there are five artesian wells flowing an aggregate of over five million gallons every 24 hours and twelve other wells which do not flow, but from which water may be pumped should the necessities of the situation require.

The city planning committee of the Chamber of Commerce convinced the city commissioners that the purity of the supply was as important as the quantity, and James H. Fuertes, consulting engineer of New York, was engaged to design a plant to secure this end. The plant has recently been completed and was turned over to the city on June 6.



ONE END OF SEDIMENTATION BASIN.



WELL WITH ARTESIAN FLOW OF 1,375,000 GALLONS
A DAY.

The plant comprises an intake works, a mixing channel, a sedimentation basin, a secondary coagulation basin, twelve filters and a filtered water reservoir. Under normal conditions the plant is designed to treat 15,000,000 gallons of water in 24 hours. It can, however, be so managed that it will deliver 18,000,000 gallons in 24 hours. It has been tested at the higher rate and has done satisfactory work.

The water, as it enters the west basin or settling basin, is first treated with calcium hydrate. The amount of this chemical will vary with the condition of the water. The calcium hydrate is added to remove the temporary hardness or that due to calcium carbonate. Next is added a solution of aluminum sulphate and the water then flows through mixing channels to the next basin, and from this into a conduit for delivery into the second coagulating basin. It takes about five days for the water to make this journey, during which time most of the calcium carbonate settles out, as well as about 75 per cent of the mud and about the same of bacteria.

From here the water flows to the secondary coagulating basin through a 42-inch cast iron pipe. The object of this basin is to give time for the reaction of a second dose of aluminum sulphate should it be found necessary to add this before the water goes to the filters.

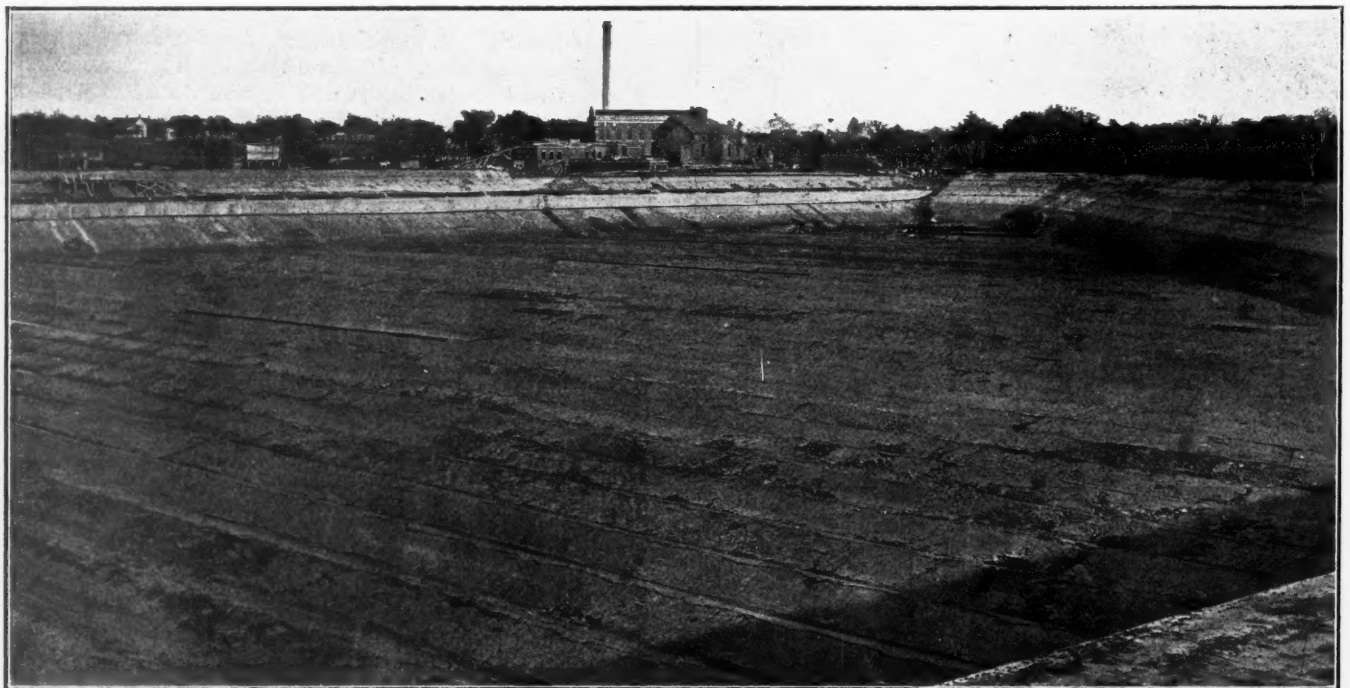
There are twelve rapid filter units in the plant, each of which will filter 1,250,000 gallons of water per day under normal conditions. They contain seven inches of hard gravel and five feet of Susquehanna river coal. This coal is a very hard anthracite and is what is known to the trade as rice size, the particles being about the size of ordinary rice. From the filters the water passes to the clear water basin.

In cleaning the filters the water is first drawn down so that there is about ten inches on top of the coal. Air is then blown through the bed, followed by filtered water. The time required for a wash is about fifteen minutes and the amount of filtered water used is about two per cent of the total amount of water filtered.

The results obtained at the plant so far have been very gratifying, 98.4 per cent of the bacteria being removed without use of the sterilizing plant. Provision is made for sterilizing, however, and with this results very close to 100 per cent have been obtained. All of the turbidity and color are removed. The amount to which the water is softened will vary from time to time, but it is expected that the hardness of the effluent will be about sixty parts per million or about 3.5 grains per U. S. gallon.

There are located at the plant the necessary pumps for handling the lime water solution, tanks for mixing and storing the various chemicals, pumps to furnish water for cleaning the filters, an operating room from which the filters are controlled, an office, lime-slaking room and a chemical and bacteriological laboratory. This laboratory is one of the best equipped in the country for filter plant work and from here analyses will be made of the raw and filtered water at least three times a day and as much oftener as may be deemed necessary.

The filtration plant cost \$230,000 and the total amount expended on the water system to date is over four million dollars.



ONE END OF SEDIMENTATION BASIN BEFORE FILLING.

The WEEK'S NEWS

A New Transcontinental Road—Brick Paving—New York's \$51,000,000 Sewage Project—Decry Summer Water Waste—Fire Losses—Motorizing Progresses Rapidly—The March of Commission Government—The Powers of City Planning Boards—Grade Crossing Elimination.

ROADS AND PAVEMENTS

Highway from Quebec, Canada to Miami, Fla.

Quebec, Canada.—The Province of Quebec will construct a macadamized road from Rouses Point, N. Y., through Montreal and thence to Quebec, 240 miles in length. This road from Montreal to Quebec will, by permission, be known as the King Edward Highway, as a memorial to the late King. The Province of Quebec will bear the entire cost of its construction, with the exception of about \$1,000 a mile which will be borne by the municipalities through which it passes. It is expected that the whole 240 miles will be finished by 1916, and when completed will constitute an unbroken stretch of macadamized road extending from Quebec, Canada, to Miami, Fla., a distance of over 2,500 miles. The construction of 240 miles of improved road means a big forward step in a province like Quebec, which in proportion to its size is very sparsely populated, while the road-making season only embraces 90 working days in the year, and the severity of the winter climate makes the cost of road maintenance unusually heavy.

Sixty Miles Brick Paving for Cuyahoga County, Ohio.

Cleveland, O.—Cuyahoga county will add sixty miles of rural brick road to its 406 miles of similar pavement according to the 1914 road improvement plans announced by County Engineer Stinchcomb. A minimum width of sixteen feet has been adopted for roads to be laid during the coming summer and the entire expenditure, including fills, bridges, etc., will be somewhat in excess of \$900,000. Cuyahoga county has expended more than eight million dollars in this type of road and the repair bills have been comparatively small. A perfect system of radiating highways now extend to the county line in every direction and the task which Engineer Stinchcomb has outlined is that of connecting these main arteries with suitable cross roads. In spite of the cost, the county is money ahead, according to county officials, for the increase in taxable rural land values has yielded more than the total cost in revenue. Cleveland with 600 miles of brick paved city streets will pave about eighty miles of streets this year, including the repaving of some of its main highways.

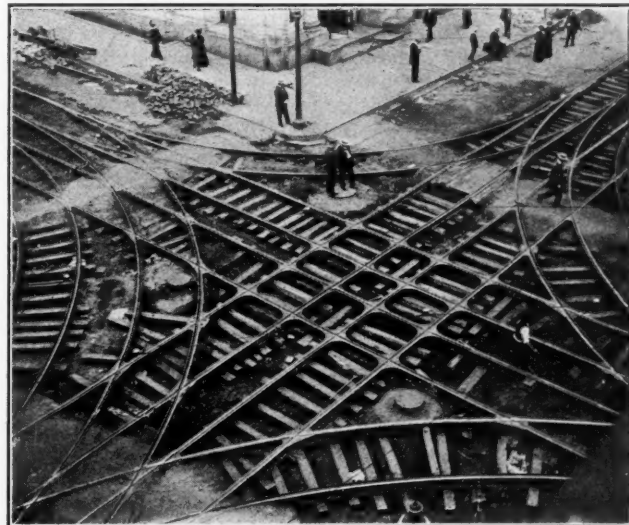
To Decide Meaning of "Permanent" Paving.

Bridgeport, Conn.—According to the opinion of City Attorney W. H. Comley, Jr., as to what constitutes a permanent pavement, "a permanent pavement is a pavement that is permanent," and it is only within the jurisdiction of the Paving and Sewer Commission to designate any kind of a pavement as permanent, to lay it as such and to assess for it as that kind of a pavement. The city attorney explains that the State Legislature has solved this problem by appointing a body, the Paving and Sewer Commission, whose conclusion in this matter shall be final. The city attorney also says that under the city charter's provisions the Board of Aldermen have the power to designate on which streets pavements shall be laid, and it is then up to the Paving and Sewer Commission to determine the character of the pavement to be laid on those streets. However, he says, the question of permanent and non-permanent pavements does not answer the question as to the respective powers of the Board of Aldermen and the Paving and Sewer Commission regarding street paving. In the strict sense of the word there is no such thing as a permanent pavement, and many pavements laid as such have failed to prove their permanency. The closing sentence of Section 7 of the Act of 1909, however, states plainly that "It shall be the duty of the director of public works to make such repairs to perma-

nent pavements as are ordered by the commission." The difficulty with this clause lies in the fact that irrespective of any individual definition of the term permanent pavement, the power to make repairs is placed upon two separate and independent departments of the city government. Mr. Comley also says that he is unable to think of any construction of the act that might obviate this difficulty, and that the only remedy to any resulting inconvenience is to be found in the amendment of the city charter.

Import Paving Brick from England.

Baltimore, Md.—Paving on Baltimore street and on Eutaw street will be accelerated by the arrival of the steamer *Austriana* from Middlesborough, England, with about 400,000 of the slag bricks which will be used for edging along the railway tracks and between the tracks on heavy grades. She carries enough of the blocks to complete all the work now pending on which such blocks are to be used. The blocks are scoria blocks and are made from slag from the furnaces in the great iron region of which Middlesborough is the shipping center. There are harder than the blocks to be had in this country for bearing up under the particular strain that is given the paving near tracks where heavy



Courtesy Baltimore (Md.) News.

BALTIMORE STREET READY FOR BLOCKS.

wagons are constantly turning in and out. On Baltimore, Eutaw and Howard streets the edging for the tracks has to be put down before the other paving can be done. The placing of concrete between the tracks up to four inches on the ties is done by the railways company. The concrete that goes on top of this and all the other work, extending for a depth of 13 inches, will be done by the city. The bill for this will be sent to the railways company. In the course of repaving of Howard street the "ribs" of the thoroughfare have been curiously exposed. The illustration shows an unusual view of the street.

Replacing Twenty-Year-Old Asphalt.

Providence, R. I.—Public Works Department men have begun to tear up the asphalt pavement in Washington row which was laid down when the big bridge was built there nearly 20 years ago. The piece of highway has been of interest to pavement experts, as it was one of the oldest stretches of asphalt road in the city. The bridge was rebuilt in March and the concrete surface laid in December, 1895. Commissioner of Public Works Walter F. Slade

stated that the surface was being torn up because the traffic through the highway had worn the asphalt topping so thin that it was inadvisable to attempt to patch it. A new asphalt topping two inches in thickness will be laid down and the concrete base will not be disturbed. Public works men were also set at the task of completing the bitulithic pavement in Exchange place. A large section of the pavement was torn up at the time the waiting and comfort station was being constructed, and had not been replaced since. Although there is a considerable area to be surfaced, the work will be finished in a few days.

SEWERAGE AND SANITATION

A \$51,000,000 Sewage Plant.

New York, N. Y.—The final report of the Metropolitan Sewerage Commission describing every phase of the problem of sewage disposal as related to New York has just been submitted to Mayor Mitchel. The report, which contains more than 760 pages, summarizes the work done by the commission from 1906 to date and describes the plans for main drainage and sewage disposal works which the commission recommends New York City to construct for the protection of the harbor. The volume contains a series of reports by experts consulted by the commission, including five critical reports by eminent sanitary engineers and four reports upon special topics, such as the corrected death rate of New York and the applicability of various processes of sewage purification. According to the commission's recommendations, the sewage should be collected to a number of central points along the waterfront and there purified sufficiently to permit the effluent to be discharged into the inner harbor where, through the activities of animals and plants, the harmful ingredients can be digested. It is part of the commission's recommendation that the absorptive capacity of the harbor be utilized to the full, in order that unnecessary expense shall not be incurred in the construction of disposal works. In course of time it will be necessary to carry some of the sewage which the growing population will produce to a distant point in order not to overtax the inner harbor and for this purpose the commission has recommended that an island be built about three miles from shore, between Rockaway Point and Sandy Hook, where some 200,000,000 gallons of sewage can be taken for treatment and disposal. According to the commission's plans, the works ultimately needed by New York should be constructed in progressive stages, those parts being built at an early date which are most necessary and additions made from time to time as the need of extensions become apparent. It is estimated that by 1916 the main drainage and disposal works required will have cost about \$14,000,000; by 1920, about \$25,000,000; by 1925, about \$38,000,000, and by 1930, when the entire system will be practically complete, about \$51,000,000. The members of the commission are: George A. Soper, president; James H. Fuertes, secretary; H. DeB. Parsons, Charles SooySmith and Linsly R. Williams.

The Right of the City to Protect Health.

Pierre, S. D.—In the case of John H. Streich against the Board of Education of the City of Aberdeen, the Supreme Court in the opinion of Whiting, holds in substance that the police power for the protection of health is not confined to literal legislative provisions, but is intended to be effective and what would be a requirement at one point and under certain conditions would be a hardship at other points and under different conditions, and must be construed to meet the ever changing views upon this subject. The appellant contended in this case that such physical examinations as were demanded by the School Board of Aberdeen, "that the examinations called for may result in such mental suggestions of disease as may result in mental disease germs," the court holds "if such examination is a menace to the health of a child owing to danger of mental suggestions, then the study of physiology and hygiene should be excluded from the schools. Time may come that this contention will be the accepted doctrine of the day, but courts must follow the accepted doctrine of the present except where such doctrine is shown to be wrong by evidence."

Pittsburgh Sewer Plans.

Pittsburgh, Pa.—N. S. Sprague, superintendent of the Bureau of Engineering, has been authorized to make plans for a sanitary sewer of the Nine-mile Run district. Four thousand five hundred acres will be affected by the sewer. Three-fifths of the territory lies within the city. The cost of the other portions will be borne by adjacent boroughs and townships.

Scarlet Fever in Torrington.

Torrington, Conn.—Hardly recovered from the typhoid epidemic of two years ago which spread to 300 cases and over thirty deaths, Torrington is now in the midst of a scarlet fever epidemic. Thirty-six cases have been reported. The disease is confined to twenty-eight houses and Chief of Police Robert B. Newett has been making a visit to each house once an hour. The school board has closed the schools. Dr. Chapin, acting health officer, says that the disease is now under control and, after conference with County Health Officer W. W. Bierce, said the situation is no longer serious.

Gasoline Fumes in City Sewers.

Boston, Mass.—Following the deadly explosion in the East Boston sewerage pumping station of the Metropolitan Water Board, Medical Examiner Magrath made an investigation. The report will probably show some of the underground passages below Boston are simply reeking with gasoline fumes, powerful enough to tear up the streets and topple buildings over, if these fumes are exploded by a stray spark.

WATER SUPPLY

More Summer Water Waste.

Bowling Green, Ky.—The severe hot weather is affecting the water supply of Bowling Green, and the strain on the part of the waterworks and those in charge is great. Recently, in one day, no less than 1,235,000 gallons of water were used, which was 250,000 gallons in excess of the record.

Gloucester, N. J.—Despite the fact that the officials and employees of the Gloucester waterworks, all of whom have made every effort in their power to see that sufficient water was pumped to meet the daily demands of the residents, it was found necessary to open the valve leading to the creek and draw a portion of the water supply from that stream. In consequence of this condition President Harlan S. Miner, of the Board of Health, has issued a notice requesting that all the residents boil the water used for drinking and cooking purposes until further notice. The very dry and warm weather has increased the consumption to a large extent.

Rochester, N. Y.—Superintendent of Waterworks Beekman C. Little has announced the by-passing of the water at Rush Reservoir, so that it comes right through to Highland Reservoir, and the other reservoirs from Hemlock Lake and is not turned into the reservoir at Rush. This was required because of the big demand for water. The consumption is now about 23,000,000 gallons a day and this is the capacity limit. The amount consumed nearly every day is greater than that which is supplied the reservoirs by the conduit, and several times it has been necessary to draw on Rush reservoir to keep the city reservoirs up to their regular supply. The capacity of Rush reservoir is 74,000,000 gallons and when this is full it will supply the city for approximately three days. The third conduit will not be finished in time to increase the supply from Hemlock and Canadice Lakes this summer and before it is over Rochester may be confronted with a real problem in the matter of supplying consumers with water. The waterworks officials will probably issue an appeal soon to consumers to be as careful as possible in using water and to shut off all waste. Any waste that can be located in the city mains will be stopped.

Dayton, O.—City officials are insisting that all Dayton people refrain from sprinkling from 5:30 to 7 o'clock in the evening. They say this would allow those persons,

who have been practically without water for several days, to get enough at least for their baths and other domestic purposes. Water Superintendent H. C. Wight stated while there was shown to be seventy pounds pressure at the water plant, a pressure of only about seven pounds could be obtained at points on the West Side. This disclosed, it is said, that while the consumption may be great at intermediate points yet the waste by leakage is also considerable. There is no lack of water at the pumping station. The great difficulty now experienced is in the matter of distribution. The mains are not adequate to assure proper distribution. This, the officials declare, discloses the necessity of the establishment of practically a new system of mains before satisfactory results can be obtained.

Boulder Water Conditions Now Normal.

Boulder, Colo.—Although the city will have to depend on creek water for drinking purposes until repairs on the broken mains are completed, the water conditions have now resumed something of normality. Pressure enough for fire purposes has been restored for some days and with the filling up of the reservoirs Mayor Armstrong rescinded the order prohibiting sprinkling. The mayor, however, asked that the citizens do not waste the water as the city is just escaping famine.

Burst Water Mains Cause Denver Famine.

Denver, Colo.—The breaking of two big conduits of the Denver Union Water Company lessened the water supply of Denver to such an extent that the City Commissioners issued a proclamation forbidding the use of water except for drinking and household purposes for two days. The proclamation followed a hurried conference between the commissioners and officers of the water company. From all parts of the city came reports of the scarcity of water. Ten blocks in North Denver had no water for three days. So serious was the situation in some parts that six of the city's big tank wagons were sent there with water from the fire plugs. Parts of Capitol Hill were entirely without water and residents of some districts attacked drivers of city tank wagons, who drove through the streets.

Ultra-Violet Ray Purification for Niagara Falls.

Niagara Falls, N. Y.—Niagara Falls will have the first ultra-violet ray water purifying system in America. The Water Commission has entered into an agreement with the R. U. V. Company of Chicago and New York for the installation of such a system in connection with the municipal plant, conditional upon the successful demonstration of this method of water treatment for a period of one year. If it proves satisfactory, the city will pay \$22,000 for the system. President W. T. Hollingsworth of Chicago appeared before the board, and explained the system. Acting Mayor Clancy appointed Commissioners McCulloh and Ryan, Corporation Counsel Anderson, Supt. Callahan and Engineer Parkhurst to draw up an agreement and supervise installation of the new system.

Meters Save for Consumers.

Connellsville, Ind.—In a fight between the water company and the consumers in regard to the installation of meters the company has proved in paid space in the newspapers that metering is an economy to consumers. The company published a list of consumers and, comparing the average bill before and after metering, it is found that 92 out of 96 customers paid less after metering.

City Against Company in Condemnation Proceedings.

Columbus, Ga.—The Columbus Water Supply Company has filed a petition with the United States Court asking for injunction against the City of Columbus in its condemnation proceedings against the Columbus Power Company to have a price fixed for certain lands wanted by the city for the purpose of establishing its waterworks system, north of the city. A temporary restraining order was granted which applies both to the City of Columbus and

the Columbus Power Company, and prohibited them from proceeding further with the condemnation proceedings until a hearing. Meanwhile the city council met and appropriated \$500 to fight the injunction proceedings to the end. The point made in the injunction proceedings is that the Columbus Water Supply Company purchased from the Columbus Power Company certain lands for the price of \$15,000 and that the rights of way for laying of pipe have been secured by the same contract, entered into last May. With this property already bought, the Water Supply Company contends that the city buying property which is right near would hinder their privileges, and prevent them from being carried out to the fullest extent.

San Francisco to Buy Water Company.

San Francisco, Cal.—After having failed to arrive at a definite conclusion upon the subject of the proposed purchase of the Spring Valley Water Company's properties the members of the city's advisory water committee decided to submit the entire proposition to the full Board of Supervisors. The nearest approach to an agreement among the members of the committee was upon City Attorney Long's tentative valuation of \$34,500,000. This valuation, according to Long, excludes about two thousand acres of the company's Merced holdings and about five thousand acres of its Pleasanton lands. It provides also for an equal division between the rate payers and Spring Valley of about \$1,750,000 of impounded moneys and for the abandonment of the city's condemnation suit. Further, this valuation would be exclusive of the payment by the city to Spring Valley of the amount of money recently expended by the company in construction work. One estimate of the total of this construction allowance is \$600,000. It appears from the statement made by City Attorney Long that the failure of the members of the Advisory Water Committee to reach an agreement was due largely to Long's positive refusal to accede to Mayor Rolph's request that Long supply him and the other members of the committee with all the evidence that had been collected by Long in preparation for the trial of the Spring Valley condemnation suit.

STREET LIGHTING AND POWER

Lightless Night for Meridian, Miss.

Meridian, Miss.—As a result of a boiler explosion, the Meridian Light and Railway Company's power house was put out of commission. One man was killed and two injured. Meridian was in total darkness. Gasoline engines, automobile and motorcycle motors and even steam engines were used to replace the electrical motors put out of commission at the plant. Meanwhile, the street cars were scattered over the city in the places where they stopped when the current was cut off. The arc lights of the entire city were finally turned on after being off for just one week. The lights in the business section of the city had been turned on for some days, the street cars running. Besides the new boiler that is being installed the company has four other large boilers.

Gas Companies Must Have Certified Meter Testers.

Columbus, O.—Fred C. Albrecht, state sealer of weights and measures, has started a campaign to compel maintenance of properly certified gas meter testers by all gas companies of the state. He sent letters to officials of each company asking information on how many meter-provers are owned, where they are located and when they were tested and sealed by the state or county sealers of weights and measures. A recent opinion of the attorney general declared it is the function of the state sealer rather than of the state public utilities commission to test gas provers.

Asks Sixty Cities to Fight Electric Rates.

Philadelphia, Pa.—United action on the part of every important city and town in the state to batter down the rates of the electric companies for both public and private lighting and power is planned by Director Cooke, of the department of public works. The Blankenburg administration is preparing to bring before the public service com-

mission a test case against the Philadelphia Electric Company to establish "what are fair rates to be paid for both public and private electric light." Cooke charges that the National Electric Light Association is organized for the defense of every one of its 15,000 members, and he has written to the mayors of sixty Pennsylvania cities and towns, inviting them to form an association to lead an attack upon the electric companies. The proposition is that the associated cities can exchange data, advise as to the employment of experts and legal services, and in that manner insure the ablest presentation of every case which may be brought before the public service commission.

FIRE AND POLICE

Massachusetts Cities' Fire Losses.

Boston, Mass.—The per capita fire loss in 1913 in the cities of Massachusetts with more than 20,000 population were as follows: Salem, \$12.08; Boston, \$5.79; Gloucester, \$4.61; Chelsea, \$3.67; Lynn, \$3.58; Malden, \$3.41; North Adams, \$3.30; Haverhill, \$2.78; Springfield, \$2.70; Northampton, \$2.52; Pittsfield, \$2.34; Cambridge, \$2.04; Lowell, \$2; Newton, \$1.93; Somerville, \$1.70; Fitchburg, \$1.65; Chicopee, \$1.62; Quincy, \$1.51; Waltham, \$1.40; Lawrence, \$1.39; Holyoke, \$1.34; Brookline, \$1.30; Fall River, \$1.26; Taunton, \$1.21; Brockton, \$1.11; Everett, \$1.09; Worcester, \$1.02; New Bedford, 52 cents; and Medford, 36 cents.

Work on Augusta's New Police Alarm System.

Augusta, Ga.—The Gamewell police alarm system of the Augusta Police Department is going to be in operation about the beginning of next month. City Electrician W. C. Davenport received a shipment of two cars of telegraph poles to finish the over-head wiring. There is about two and a half miles of the over-head work to finish before the city's end of the contract is fully completed. The forty boxes, comprising the system, have been installed for some time, this work being done by Mr. Davenport and his assistants, and the large switchboard has arrived.

New York's Fire Loss.

New York, N. Y.—Property destroyed by fire in this city last year was worth \$7,467,997. The average loss in the 12,958 fires was \$536.72, and the loss per capita \$1.38. The per capita loss was the lowest in the history of the Fire Department, according to the annual report for 1913, which Commissioner Adamson sent to Mayor Mitchel. The greatest single cause of fires was "carelessness with cigars, cigarettes, etc.," to which 1,079 fires are attributed. Carelessness with matches caused 1,175 and bonfires and brush fires 1,058. Improper use of gas is blamed for 753, and 311 are attributed to "mischievousness of boys and others."

Office Building as Water Tower.

Cincinnati, O.—A test made by Chief Bunker of the use of the Union Central Life Insurance Building in case of fire nearby showed that flames in smaller buildings nearby could be held in check by streams of water shot down from the upper floors of the skyscraper. A fire engine was attached to a plug in front of the building and a line of hose hoisted to the eighteenth floor. From here up smaller lines were used. The tests were witnessed by Acting Mayor Dauner, Safety Director Holmes, Service Director Fosdick and other officials, as well as many insurance men.

MOTOR VEHICLES

Lynn Hose Wagon Tractorized.

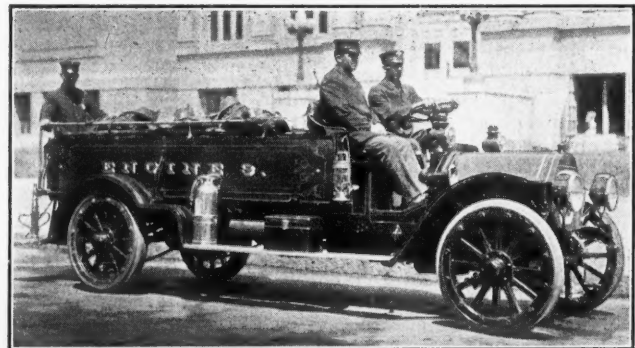
Lynn, Mass.—Engine 3 of the Federal street engine house being equipped with an A. & B. tractor made by the American & British Mfg. Co. of Providence, the last horse-drawn apparatus in the house gave way to a power-drawn apparatus. By the change three horses left the house. Engine 3 is of the second size Amoskeag type, and is capable of throwing 800 gallons of water a minute. As to speed, when hard pressed, 30 miles can be made, but the average speed is 25 miles an hour.

Test New Motor Truck.

Elizabeth City, N. C.—Elizabeth City's \$6,000 motor truck and chemical engine is being tried out daily by a representative of the American-La France Fire Engine Company to demonstrate its efficiency to the chief of the fire department and to the Board of Aldermen. The auto truck and chemical engine has a 75 H. P. engine and can develop a speed of 45 miles an hour. It is fitted with a forty gallon tank of chemicals and 1,200 feet of 2½-inch hose, with a number of hand extinguishers, ladders, etc. This apparatus will take the place of the horse hose wagons.

New Chemical Received.

Sylvan Beach, N. Y.—A new 40-gallon chemical engine has just been delivered by the O. J. Childs Company of Utica, N. Y., to the Sylvan Beach Fire Department. A new 40-foot ladder has also been added to the equipment.



Courtesy Lynn (Mass.) Daily Item.

LYNN'S MOTORIZED HOSE WAGON.

With two hose carts with ample hose for each and the new chemical engine and other equipment, Sylvan Beach is probably well provided with fire protection.

New Auto Engine Passes Tests.

Charlotte, N. C.—In the tryout of the fire-fighting equipment of the city the new American-La France triple combination motor truck and pump was given its first test. Both this car and the other La France car, on which a smaller pump was installed last winter, and also the old steamer, exceeded the point of guarantee by a good margin. The new car, guaranteed to pump 700 gallons of water a minute, delivered no less than 1,030 gallons and it furnished a pressure of 260 pounds to the square inch.

New Auto Apparatus Arrives.

Suffolk, Va.—The demonstrator has been testing the new motor truck for the fire department, which just arrived with the new chemical engine and hose wagon. All of this motorized apparatus, with the recently motorized Nott engine, from the American-La France Fire Engine Company, gives Suffolk a very up-to-date fire-fighting equipment.

GOVERNMENT AND FINANCE

Mayor Blankenburg Invites Mayors.

Philadelphia, Pa.—Mayor Blankenburg will invite the mayor of every first-class city in Europe and America to appoint a representative to the International Conference on Home Education, to be held here next September. Announcement to that effect was made at a meeting of a local committee of educators appointed to make arrangements for the convention. Besides the municipal representatives, almost every country in the world will send rational delegates, and the head of every state school system in this country will be asked to attend. It was also announced that Congress is expected to invite foreign educators through the department of state. The convention will be held under the patronage of President Wilson. The list of American speakers includes Judge Ben Lindsey, Dr. G. Stanley Hall, famous expert in juvenile problems,

and Miss Julia Lathrop, head of the children's bureau at Washington. While the general purpose of the convention is to promote education in the home, every phase of philanthropy, social service, pedagogy and juvenile health will be discussed.

Commission Rule and City Debt.

Washington, D. C.—There are 69 cities out of 195 in the United States having an estimated population of over 30,000 inhabitants each, which have already adopted a commission form of government, having discarded the former plan of being governed by a mayor and common council. The figures show that the average per capita cost of municipal government in the cities under commission rule is \$11.63, as compared with an average per capita cost in all of the 195 cities of \$17.34. It is further shown by the figures that the per capita net debt of the commission-governed cities is \$44.70, as against a per capita net debt of all of the 195 cities of \$68.74. The names of the cities and the cost per capita for the general expenses of all the municipal departments, and also the per capita net debt at the close of the year 1912, of these 69 cities, which have adopted the commission form of government, respectively, are shown in the statement following:

Alabama—Birmingham, \$8.64-\$38.55; Mobile, \$8.53-\$54.54; Montgomery, \$9.68-\$65.35. California—Berkeley, \$13.32-\$19.06; Oakland, \$14.52-\$36.68; Sacramento, \$18.94-\$26.07; San Diego, \$20.07-\$87.40; Pasadena, \$19.07-\$45.14. Colorado—Colorado Springs, \$16.94-\$73.48; Pueblo, \$10.94-\$57.27; Denver, \$20.13-\$3.82. Illinois—Decatur, \$8.66-\$9.79; Springfield, \$12.29-\$20.82. Iowa—Cedar Rapids, \$11.88-\$32.62; Des Moines, \$14.30-\$30.09; Sioux City, \$10.57-\$31.38. Kansas—Kansas City, \$9.73-\$57.98; Topeka, \$11.58-\$36.72; Wichita, \$9.61-\$40.17. Kentucky—Newport, \$7.88-\$38.86; Covington, \$9.88-\$41.51; Lexington, \$11.46-\$24.78. Louisiana—New Orleans, \$12.79-\$122.81; Shreveport, \$11.06-\$19.08. Massachusetts—Haverhill, \$13.93-\$37.66; Lowell, \$13.10-\$24.22; Lynn, \$13.65-\$36.32; Salem, \$13.09-\$27.12. Minnesota—Duluth, \$13.95-\$78.29; St. Paul, \$13.01-\$43.19. Missouri—Joplin, \$7.96-\$10.25. Nebraska—Omaha, \$16.36-\$109.23; Lincoln, \$10.79-\$25.98. New Jersey—Atlantic City, \$22.76-\$116.10; Passaic, \$10.07-\$28.40; Trenton, \$11.58-\$22.09; Jersey City, \$13.90-\$72.80. Oklahoma—Muskogee, \$11.02-\$65.65; Oklahoma City, \$10.40-\$66.24. Oregon—Portland, \$13.10-\$48.68. Pennsylvania—Allentown, \$6.47-\$17.11; Altoona, \$8.07-\$39.25; Chester, \$7.48-\$30.75; Erie, \$8.83-\$9.01; Harrisburg, \$10.24-\$37.64; Johnstown, \$7.17-\$8.93; Lancaster, \$7.61-\$29.04; McKeesport, \$10.91-\$21.89; New Castle, \$9.16-\$14.04; Reading, \$8.22-\$15.27; Wilkes-Barre, \$9.22-\$25.16; Williamsport, \$8.57-\$12.15; York, \$6.58-\$19.78. Tennessee—Chattanooga, \$11.28-\$66.82; Knoxville, \$10.31-\$83.51; Nashville, \$10.92-\$50.02; Memphis, \$12.95-\$75.33. Texas—Austin, \$9.14-\$75.56; Dallas, \$11.11-\$36.22; El Paso, \$11.60-\$54.65; Fort Worth, \$8.91-\$59.25; Galveston, \$11.63-\$113.24; Houston, \$11.95-\$73.95. Utah—Salt Lake City, \$14.48-\$57.61. Washington—Spokane, \$14.67-\$65.56; Tacoma, \$14.16-\$105.96. West Virginia—Huntington, \$6.97-\$23.02. Wisconsin—Oshkosh, \$9.49-\$14.32; Superior, \$12.65-\$23.11.

Of these 69 commission-governed cities only five have a larger per capita cost of government than the average of the 195 cities of over 30,000 population. These five are Sacramento, Pasadena, San Diego, Denver and Atlantic City. Only 13 of the 69 have a larger per capita net debt than the average of the whole 195. These are San Diego, Colorado Springs, New Orleans, Duluth, Omaha, Atlantic City, Jersey City, Knoxville, Memphis, Austin, Galveston, Houston and Tacoma.

Cannot Test Validity of New Charter.

Middletown, Ohio.—The Court of Appeals has handed down an opinion in the case of Jacob F. Heer, former mayor of Middletown, to test the new charter of the city of Middletown. The court holds that Heer did not have the right to bring the suit, but that this power rests only in the Attorney General. The petition, therefore, was dismissed. In regard to the validity of the new charter, however, the court says: "Full consideration of all the objections to this charter shows no invalidity except that part which undertakes to establish a Municipal Court having jurisdiction over State cases. It is contended that the invalidity of this provision would be such as to make the entire charter invalid. We do not regard it as necessarily so. Courts of Justices of the Peace and the other State courts are open for all State offenses. In regard to the enforcement of ordinances we have already intimated that the Municipal Court provided by this charter might be upheld as to its jurisdiction in that respect, but, even if it should not be, other provisions for the enforcement of city ordinances might be made. In our opinion the provision for a Municipal Court is not such an essential part of the scheme of city government provided by the charter, or so interwoven with it, that it must be upheld in its entirety or the whole charter held to be invalid."

Court Decides Against City Planning.

Altoona, Pa.—Activities which have been urging the establishing of a city planning commission as provided by an act of assembly approved by Governor Tener on July 16, 1913, has just received a setback as the result of a decision that has just been made by Judge William B. Broomall, of Delaware county. The law provides for a commission of five members who shall have jurisdiction in the city and for a distance of three miles beyond the limits. All ordinances relating to buildings, the laying out of streets, parks, playgrounds, etc., must be submitted to and approved by the planning commission before they can be enacted, and quite a large authority is placed in the body's hands. Anyone living within a radius of three miles from the city, upon laying out or plotting ground, must submit plans to the commission which must be approved before the work is done. The case decided was that of two builders who applied to the city building inspector, T. T. Williams, for a permit for the construction of 14 houses. They were denied a permit on the ground that the proposed layout of the building operation was not in accordance with the city's building laws. Judge Broomall decides that the city planning commission appointed by the council of the city under and pursuant of the act of assembly has no jurisdiction to approve or disapprove of said operation and no power or authority in connection therewith and that the action of the said city planning commission disapproving of the said operation is void and of no effect. Under the terms of a decision like that, should it be upheld by the highest courts, a planning commission would have no authority whatever.

Batavia, N. Y., Adopts New Charter.

Batavia, N. Y.—A new era in the history of Batavia has begun, citizens having voted favorably on the charter proposition, making it the 54th city of the State of New York, the vote being 795 for and 212 against. Batavia was incorporated as a village on April 23, 1823, a little over 91 years ago.

Governor Signs Attleboro Charter.

Attleboro, Mass.—Gov. David I. Walsh has affixed his signature and the bill now waits for the approval or disapproval of the town. A negative vote will end the charter. An affirmative vote will make Attleboro a city and cause the selectmen to arrange for the first city election, which would then be held the second Tuesday of December.

MISCELLANEOUS

Plan Board Wants Abutters to Pay.

Boston, Mass.—That abutters on private ways be compelled to pay the entire cost of constructing private ways into streets and that the money shall be paid within a year after said construction, is the recommendation just submitted to Mayor Curley by the City Planning Board. City Hall authorities agreed with the mayor, asserting that chapter 323 of the Acts of 1891 made provision for the plan the board recommends, but the Supreme Court ruled that the provision was unconstitutional. The board believes that when the city accepts a street for the purpose of making it a public way, the abutters should give the fee in the land to the city and should in addition pay the cost of construction within one year. At present the city assesses betterments when a street is laid out, and ten years is given in which to pay the assessment.

Grade Crossing Abolition in Pennsylvania.

Harrisburg, Pa.—The Public Service Commission at its session at Harrisburg had under consideration the abolition of an unusual number of grade crossings in various parts of the State, and the expectation is that by the end of the year there will be a marked reduction in the number of death traps. A contract was considered between the city of Philadelphia and the following railroads: Philadelphia, Baltimore & Washington; Pennsylvania, Baltimore & Ohio; Philadelphia Belt Line. This contract provides for the abolition of about 40 grade-crossings by the construc-

tion of an elevated structure over certain streets, the abandonment of certain tracks and the construction of new tracks in new locations without grade crossings. The contract has been approved for the construction of the Wilkes-Barre Connecting Railroad, which involves 19 crossings of highways above or below grade, which will result in the deflecting of much of the freight now routed through the center of the city of Wilkes-Barre to a new route over the connecting railroad around the city. Statistics gathered some time ago show that there are about 10,000 public crossings at grade in this State, and that prior to January 1, 1914, when the public service act became effective, the grade-crossing accidents averaged about 10 every month.

New City Hall for Niagara Falls, N. Y.

Niagara Falls, N. Y.—Plans for the new city hall of this city have been completed by the architect, C. F. Obenhack. The building is impressive—it is 108 feet long by 88 feet wide and consists of three stories and basement. The design is modern French renaissance and the facings are granite for the basement and Indiana limestone for the remainder of the building. The principal interior feature is the rotunda in the center of the building which is 44 feet in diameter, has sixteen marble columns on each floor and will extend to the roof where it will be crowned with a polychrome terra cotta dome worked in panels. The offices will be in the basement and on the first and second floors, the third floor being given over to the city and other courts and council chambers. The latter will be 38 by 78 feet and 22 feet high and in the Louis XV style. The room will be lighted from domes in the ceiling. The city offices



NIAGARA FALLS (N. Y.) NEW CITY HALL.

except the police and school departments will be housed in the building. The cost will be \$400,000. The contract has not yet been let, but work is expected to commence in the fall.

Smoke Abatement Successful.

Philadelphia, Pa.—Philadelphia manufacturers are saving hundreds of thousands of dollars annually by co-operating with the city in the abatement of the smoke nuisance, according to John M. Lukens, chief of the bureau of boiler inspection. More than \$3,000,000 has been expended in Philadelphia in the last three years for machinery tending to reduce smoke, but Mr. Lukens asserts that a gain of from 10 to 12 per cent in economy has resulted. At the present rate of improvement, Mr. Lukens says that Philadelphia will have virtually no smoke nuisance in a few years. Philadelphia is placed under a novel surveillance every clear day for violators of the ordinance against the smoke nuisance. Inspectors Connell and McNally mount to the top of City Hall tower and scan the city with field glasses. Factories and other plants that are seen to be emitting thick, black smoke are noted and the offenders are told to abate the nuisance.

The Topeka Survey.

Topeka, Kans.—In the report of the Department of Surveys and Exhibits of the Russell Sage Foundation, New York City, just presented to the Topeka Improvement Survey Committee the condition of delinquency and correction agencies in the city are considered. It was found on investigation that over 1,600 persons were arrested in Topeka last year and that there are only twenty-nine members in Topeka's police force. Topeka is sixteenth on a list of eighteen cities of about the same size as far as police facilities go, having 1,600 inhabitants to one policeman. Methods of improving the efficiency of the force are considered, the bad condition of the courts and jails pointed out and a municipal farm for prisoners similar to that of Kansas City is suggested as a remedy.

Municipal Freight Terminal for Brooklyn.

Brooklyn, N. Y.—The first municipal freight terminal in the City of New York has been planned for the Brooklyn waterfront. The Board of Estimate and Apportionment in June, 1913, approved plans for a municipally owned freight railroad extending along the waterfront from Brooklyn Bridge to Bay Ridge. The construction of this line will permit the collection of commercial freight at a central point in the middle section near Erie Basin, where there will be a great classification yard and shipments will be segregated and arranged for direct routing by way of the various trunk lines reaching all parts of the continent. These goods will be gathered from the entire chain of warehouses and manufacturing plants and the ships all along the waterfront and transhipped at the great freight clearing house at Erie Basin, thus bringing all parts of the five-mile stretch of busy waterfront in close connection one with the other and with all the big railroad termini on the New Jersey shore. The city's plan contemplates the acquisition of the existing railroads in the northern and southern sections and the construction of a connecting link. It is proposed that this railroad, when completed, shall be entirely municipally owned, but that it shall be operated by a company composed of all the trunk line railroads reaching the port of New York. A tentative agreement has been reached with the railroads. The cost of the carrying-out of the entire improvement as at present planned is estimated at \$11,236,516. It is said by the city officials that the service of the railroads can be enormously increased by means of spur lines constructed through the east and west streets of the manufacturing district for one, two or three blocks, say, back from the waterfront, thus offering the benefits of this economical and efficient service to a vast area and greatly encouraging the growth of the Brooklyn manufacturing district.

Leaves Money for Investigating City Affairs.

Philadelphia, Pa.—A provision for the establishment, at the option of eventual heirs, of a trust fund to be used for the investigation of public contracts and municipal affairs is contained in the will of William W. Justice, who during his life was active in organizations working for political reform. The fund is to be administered by a board of trustees to be appointed by the Franklin Institute, the Law Association of Philadelphia, the College of Physicians, City Club, Board of Trade, Board of City Trusts and the University of Pennsylvania. The duty of the board will be to "obtain the honest and impartial enforcement of the terms of all contracts made by the city, obtain the prompt prosecution of and just punishment of all persons guilty of violating contracts with the city, and to investigate municipal affairs and obtain and disseminate information."

LEGAL NEWS

A Summary and Notes of Recent Decisions—
Rulings of Interest to Municipalities

Sewer Assessment—Validity—Right to Object.

Robertson Lumber Co. v. City of Grand Forks (N. D.), et al.—Where, after the passage of an ordinance authorizing the construction of a sewer, an amendment is introduced reducing the area of the sewer district, but by accident or mistake the ordinance as passed increases, instead of reduces, the area, but plats and maps are filed with the city auditor properly describing the course of said sewer and said district, and the contract for the construction of the sewer is let in conformity therewith, and after the construction of the sewer and before the levying of the special assessment to pay therefor the ordinance is amended, so as to conform to the proposed and original amendment, a property owner, whose property has at all times been included within the areas covered, and who has made no objection based upon the defect of description either before the commissioners or the city council, is not entitled to a decree in equity setting aside and declaring invalid such assessment.—Supreme Court of North Dakota, 147 N. W. R., 250.

Firemen's Benefits—Forfeitures.

Anderson v. Firemen's Relief Association of City of Milwaukee.—Under St. 1911, section 1987, providing that members of a police or firemen's relief association, who became such subsequent to May 1, 1899, should not be entitled to any benefits of such association from the time they ceased to be active members of the police and fire department, and the articles of such relief association providing for the payment of a specified benefit to the beneficiary of a deceased member in good standing at his death, and that, whenever any member should cease to be an active member of the city fire department, he should cease to be a member of the association, and his name should be stricken from the rolls, and that he should thereby forfeit all claim to membership, and neither he nor his beneficiary should have any claim against the association, a member ceasing to be an active member of the department automatically lost the benefits of the association, but the rights of his beneficiary were not cut off so long as his name was carried on the rolls; and hence where a member ceased to be an active fireman because of insanity, and thereafter died before his name was stricken from the rolls, the beneficiary was entitled to the specified benefit.—Supreme Court of Wisconsin, 147 N. W. R. 1.

Gas Companies—Municipal Regulations.

United Fuel & Gas Co. v. Commonwealth.—The council of a city of the fifth class had no power to make an ordinance imposing a fine on corporations discriminating improperly between their patrons, and had no such right by virtue of a franchise granted to a gas company which provided that the grantee should not discriminate against consumers in delivering gas, as one party to a contract cannot impose a fine on the other party for a violation of the contract, in the absence of legislative authority.—Court of Appeals of Kentucky, 166 S. W. R., 783.

Sidewalks—Defects—Variance.

Best v. City of St. Joseph, Mo.—Where plaintiff, who was injured by falling on a sidewalk, alleged that the walk was dangerous by ice forming in lumps and ridges thereon, and the proof showed such defect and that it had remained so long enough to enable the city to know of it by ordinary care, and plaintiff's right to recover was based in the instructions on a finding of such facts, a contention that plaintiff was allowed to recover on the ground that the walk itself was rough and uneven having been constructed of cement blocks laid loosely on the ground with large and irregular cracks between them, which the evidence also tended to show, was unsustainable.—Kansas City Court of Appeals, 166 S. W. R., 817.

Eminent Domain—Right to Compensation—Estoppel.

In re Board of Water Supply of City of New York.—Where, in a proceeding to appraise the value of land condemned by a city for water supply purposes, the owners of a business established thereon acquiesced in their mother's assertion of title to the land, and in her obtaining an award based upon such ownership, they could not, in a proceeding to establish the damages to their business, present any claim, except such as was wholly independent of the land and any interest therein. Where the owners of a business damaged by the condemnation of the real property upon which it was established were merely tenants at will of the land, the decrease in value of the business was to be determined in view of the profits therefrom, but, if it actually produced a profit, it did not matter that the business had no established market value. In determining the value of a business established upon land condemned, interest on the capital invested in real and personal property at the market rate, or, where the owner of the business did not own the real property, the rental paid therefor, together with a reasonable amount for the depreciation in the personal property, should be charged against the gross profits as an expense; and there should also be charged against the gross profits of the business the reasonable cost or value of all labor necessary to maintain it, though performed by the owner of the business and the members of his household. In determining the value of a boarding house and livery business established on a farm condemned by a city, the market value of the farm produce used at the boarding house and fed to the horses used in the livery business was an expense to be charged against the profits of the business. That the owner of an established business on land condemned by a city was fortunate in developing a business at another place, or obtaining favorable employment, could not be used to mitigate or lessen his damages from the taking of the land.—Court of Appeals of New York, 105 N. E. R., 213.

Defective Sidewalks—Injuries to Pedestrians—Liability.

Conley v. Village of Hudson Falls, N. Y.—A village allowed, for the private purpose of the abutting owner, a water gate projecting above the sidewalk about two inches. It was within a foot of the curb, and about six feet from the other side of the walk. It had remained in the same position for 15 years. A pedestrian stumbled over the gate and was injured. There was no evidence, except the testimony of a son-in-law, that any one else had stumbled over the obstruction, or that any one had suggested that it was dangerous. Held, that a verdict adjudging the village liable was authorized.—Supreme Court, Appellate Division, 147 N. Y. S., 567.

Defective Streets—Negligence.

Saxon v. Town of Houlka (Miss.).—Where the officials of a town knew of the defective condition of a street either by reason of driving over it or by having their business places near it, the town officials were negligent in permitting the street to remain in a defective condition, and the town was liable for injuries to a traveler who was thrown from his vehicle when a wheel struck the defect. A traveler who knows that a street is not in general good condition, but who does not know of a concealed hole therein, and is not aware of the danger because the hole was hidden, is not guilty of contributory negligence in driving over the street in the ordinary way.—Supreme Court of Mississippi, 65 S. R., 124.

Pollution—Injuries to Properties.

Rhodes et ux. v. City of Durham (N. C.).—Where plaintiff's property extended to within 50 yards of a stream, and was injured by a discharge of sewage into the stream by defendant city, the fact that the property did not abut on the stream, and that there had been no physical invasion of plaintiff's rights in the same, did not prevent plaintiff from recovering permanent damages resulting to his land from the nuisance. Where plaintiff's land was injured by the pollution of a stream used to receive the sewage of defendant city it was no defense to an award of permanent damages for the nuisance so created that the conditions complained of might be modified or altogether removed by the alteration and improvement of the sewage system.—Supreme Court of North Carolina, 81 S. E. R., 938.

NEWS OF THE SOCIETIES

Calendar of Meetings.

June 30-July 4.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Seventeenth Annual Meeting, Hotel Traymore, Atlantic City, N. J. Edgar Marburg, Secretary, University of Pennsylvania, Philadelphia, Pa.

July 3-4.

AMERICAN SOCIETY OF ENGINEERS, ARCHITECTS AND CONSTRUCTORS.—Midsummer Convention, Brighton Beach, N. Y. T. Hugh Boorman, Secretary, 35 W. 39th St., N. Y. City.

July 4.

SOCIETY OF ENGINEERING CONTRACTORS.—Annual Convention, Brighton Beach, J. Wemlinger, Secretary, 11 Broadway, N. Y. City.

July 8-9.

NORTH CAROLINA GOOD ROADS ASSOCIATION.—Annual Meeting, Durham, N. C.

July 16-19.

OHIO ELECTRIC LIGHT ASSOCIATION.—Annual Convention, Cedar Point Ohio. Secretary, D. L. Gasgill, Greenville, Ohio.

July 17 and 18.

TRI-STATE PACIFIC COAST GOOD ROADS ASSOCIATION.—Annual Convention, Medford, Ore. George E. Boos, Secretary, Medford.

Aug. 5-7.

COUNTY COMMISSIONERS OF PENNSYLVANIA.—Annual Convention, Erie, Pa. T. W. Waterhouse, Chairman Local Committee.

Aug. 10-12.

MONTANA GOOD ROADS CONGRESS.—5th Annual Convention, Great Falls, Mont. Secretary, Walter S. Clark, Great Falls.

Aug. 10-15.

MASSACHUSETTS STATE PERMANENT FIREMEN'S ASSOCIATION.—Annual Convention, Lynn, Mass.

Aug. 18, 19, 20.

FIREMEN'S ASSOCIATION OF THE STATE OF NEW YORK.—Geneva, N. Y.

Sept. 11-12.

STATE FIRE MARSHALLS' ASSOCIATION OF NORTH AMERICA.—Annual Convention, Asheville, N. C.

Oct. 28-31.

NORTHWESTERN ROADS CONGRESS.—Milwaukee, Wis. Secretary, J. P. Keenan, Milwaukee.

Nov. 9-13.

AMERICAN HIGHWAY ASSOCIATION.—Fourth American Road Congress, Atlanta, Ga. Secretary, J. S. Pennypacker, Colorado Building, Washington, D. C.

Nov. 18-20.

WASHINGTON STATE GOOD ROADS ASSOCIATION.—Spokane, Wash. Secretary, M. D. Lechey, Alaska Building, Seattle, Wash.

Dec. 14-17.

AMERICAN ROAD BUILDERS' ASSOCIATION.—11th Annual Convention; 5th Annual Good Roads Congress, and 6th Annual Exhibition of Machinery and Materials, International Amphitheatre, Chicago, Ill. Secretary, E. L. Powers, 150 Nassau st., New York, N. Y.

Municipal League of Indiana.

The annual meeting of the Municipal League of Indiana, to be held at Columbus July 7, 8 and 9, will be addressed by many people of prominence from various sections of Indiana. Some of the main subjects and the speakers are: "The Filtration of a City Water Supply," by S. W. Potter, of Washington, Ind.; "The Three Mile Road Law as It Has Affected Us," by J. C. Herron, city attorney of Kokomo; "Municipal Markets," by Mayor Robbins, of Richmond; "The Betterment of the Race," by Dr. J. N. Hurty, state health commissioner; "Track Elevation in Smaller Cities," by John A. Gavit, city attorney of Hammond; "Sewering a City," by H. T. Watts, city engineer of Vincennes, and "Municipal Ownership of Public Utilities," by Mayor McCarty, of Washington.

New York State Association of Chiefs of Police.

On June 12 and 13, one hundred and fifty police chiefs and local policemen gathered for their annual convention in Buffalo, N. Y.

Chief Regan, of Buffalo, spoke at some length regarding his plan for the unification of vehicle laws throughout the State. A letter was read from A. J. Deer, of Hornell, president of the State Automobile Association, praising the effort and assuring the police officers of the hearty co-operation of the State automobilists in securing such uniform legislation. Major Richard Sylvester, superintendent of the police of the District of Columbia, outlined the work of the International Association of Police Chiefs.

The second day of the State convention opened with a business meeting at the Hotel Iroquois. Michael Regan, superintendent of the Buffalo police department, was re-elected as president of the State association. James J. Lane, chief of the department at Hudson, was re-elected vice-president, and Chief James L. Hyatt, of Albany, was again chosen as secretary and treasurer. Chief James Donovan, of Port Chester was made a member of the board of governors. Watertown, N. Y., will be the convention city for 1915.

Engineers' Club of Baltimore.

At the annual meeting of the Engineers' Club of Baltimore on June 11th, it was announced that the membership had increased 25 per cent during the last year.

Officers were elected as follows: President, Francis Lee Stuart; second vice-president, Alfred H. Hartman; secretary, William D. Janney; treasurer, Elliott H. Burwell; directors for two years, J. Ernest Harrall, Henry G. Shirley and H. B. Stabler, and director for one year, Stanley A. Alexander.

International Association of Chiefs of Police.

Last week the association held its annual convention in Grand Rapids, Mich.

Mayor Richard Sylvester, of Washington, D. C., declared against rioters in an interesting address. Chief of Police W. J. Young, of St. Louis, came out strong in defense of the segregated district and the convention went on record later in favor of his stand.

The name of William J. Burns, president of the Burns' National Detective Agency, was stricken from the roll of the association.

The 1915 convention will be held in Cincinnati, Ohio.

Following is a list of chiefs admitted to membership in the association: Ovide Vien, Council Bluffs, Iowa.

J. A. Clousen, St. Joseph, Mo.

John J. Halpin, chief of detectives, Chicago.

James Gleason, Chicago.

John Roberts, Wilkes-Barre, Pa.
Gen. J. O. Royer, chief citizens' police, Los Angeles.

C. O. Riley, Macon, Ga.

O. B. O'Brien, Edgewater, N. J.

Pontus Heintz, Gary, Ind.

Fred C. Roach, Jacksonville, Fla.

George C. Chambers, Port Huron, Mich.

O. R. Montgomery, Fort Worth, Texas.

H. W. Dunn, Omaha, Neb.

North Carolina Health Officers' Ass'n.

At Raleigh, seventy-five health officers from all parts of the State gathered for their annual sessions.

A feature of the convention was the address by Governor Craig on "State Responsibility for Human Life."

The address of welcome was by Editor Clarence Poe of The Progressive Farmer. Dr. George M. Cooper, of Clinton, who is president of the association, spoke on the scope of public health work in North Carolina. He is health officer for Sampson County.

Dr. H. R. Carter, of the United States Public Health Service, made an address on "The State's Malarial Problem" in which he insisted that there must be systematic sanitation and drainage work throughout eastern and piedmont Carolina before satisfactory relief can be assured. Dr. I. B. McBrayer, chief of the bureau of tuberculosis of the State Department of Health, spoke on the work along this line of health effort, treating especially the work being accomplished at the State Sanatorium at Montrose.

During the afternoon session there was general discussion of such subjects as "Sanitary Instruction of School Children;" "How to Get Defective School Children Treated;" "Medical Inspector's Relation to Mentally Defective Children;" "Score-Card System for Sanitary Survey of School Buildings and Grounds;" "Fundamental Principles of Rural Quarantine." During the night session there were general discussions of "The Place of the County Officer in Health Work" and proper programs for the Summer months' work of those health officers who are devoting their whole time to the work.

The association elected the following officers: President, Dr. W. M. Jones, Guilford County; vice-president, D. E. Sevier, Asheville; secretary-treasurer, Dr. W. S. Rankin, Raleigh.

Hudson Valley Volunteer Firemen Association.

At the convention which was held in Haverstraw, N. Y., on June 17, it was decided to hold the 1915 convention in Kingston.

The following officers were elected: Samuel Fowler, of Rensselaer, president; Seth Cole, of Catskill, was elected vice-president; James Osborn, of Poughkeepsie, second vice-president, and Patrick McCarthy, secretary. J. F. Hahn was elected one of the board of directors. The delegate to the state convention will be Charles Myers.

NEW APPLIANCES

MORRIS CENTRIFUGAL PUMP.

Centrifugal Pumps of Various Designs, Sizes and Capacities For Water Works.

The line of centrifugal pumps, hydraulic dredges and steam engines made by the Morris Machine Works, Baldwinsville, N. Y., include pumping outfits for all purposes with capacities from 30 gallons to 56,000 gallons per minute for centrifugal pumps and 14 cubic yards to 4,080 cubic yards of material per hour for dredging pumps.

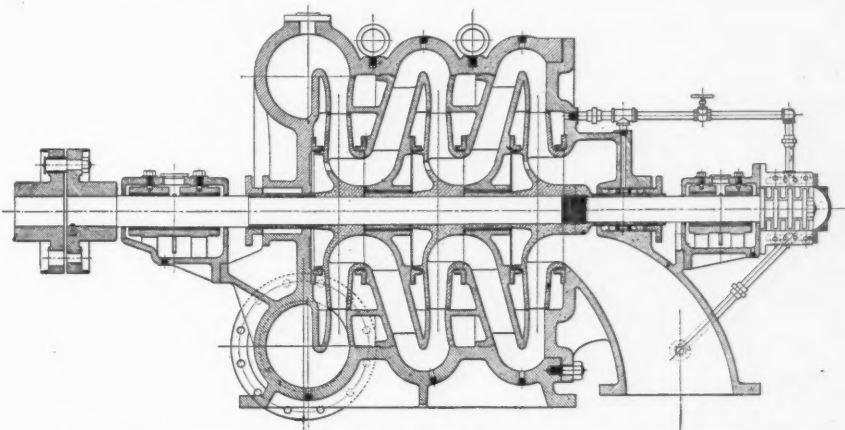
The centrifugal pumps are made both in standard horizontal designs and as vertical pumps. The suction may be single side suction or double suction; the latter pumps being perfectly balanced for side thrust by receiving half of its capacity on each side of the runner, while the former are simpler and are also entirely hydraulically balanced. While the horizontal shaft pump is generally used, there are many situations where a vertical pump is better adapted—as in excavation work. The Morris Vertical Pump is intended for total immersion in water and is therefore always ready to start and has no stuffing box. When, as is very general, the vertical pump is used in handling sewage, it is usually driven by vertical shaft electric motors. The pump is usually placed on a steel foundation so that with high water level it is submerged and primed; then automatically started and the pumping continued until a predetermined level is reached when the motor automatically stops.

The standard horizontal pumps—most extensively used for general work—has the pump shell directly mounted on the base. There are substantial babbit-lined bearings on each side of the pulley. The shaft is steel and of large diameter; the stuffing box bearing is babbitted and long and the stuffing box

itself is deep. The ordinary pumps are for heads up to about 60 feet and for higher heads the shell is made extra heavy. The pumps are very flexible giving greatly increased capacities at good efficiency.

The stage pumps are generally made in two, three or four stage designs and are commonly used in high-pressure pumps for waterworks. These have a small number of rotative parts so that the wear is slight, the attention required small and because of the high speed they occupy small space and require in-

rect-connected drive is used. Steam turbine driven pumps are made for high head where steam is available; these may be used for boiler-feeding service. The electrically driven pumps are so designed that under no head will the power exceed 25 per cent. increase over that required for designed head, so that no overloading of the motor is possible. The standard pumps of this type are double-suction with solid volute shells and side discs. Horizontally split pumps are made so that the interior may be exposed for inspection by lift-



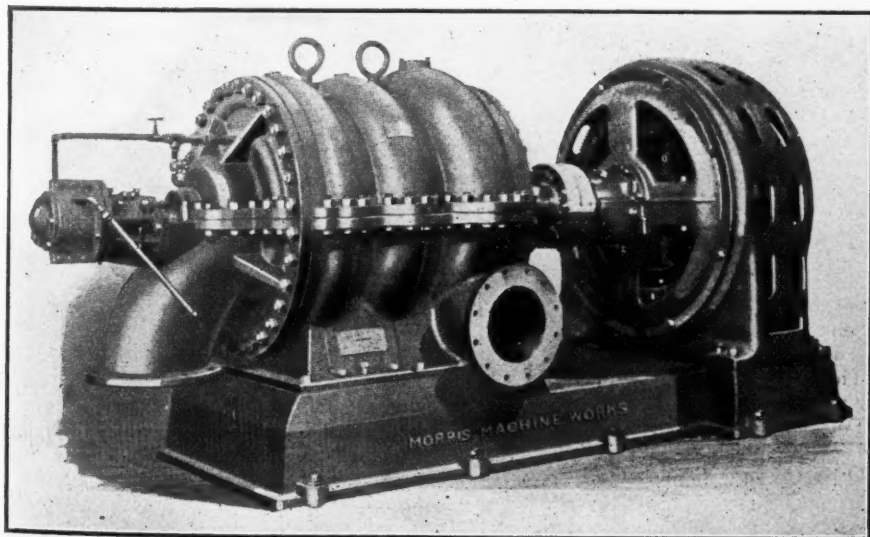
SECTIONAL VIEW OF MORRIS THREE-STAGE HIGH PRESSURE PUMP.

expensive foundation. The impellers are enclosed except in the smallest sizes. Although balanced for end thrust there are thrust bearings which, in the larger sizes, are water cooled.

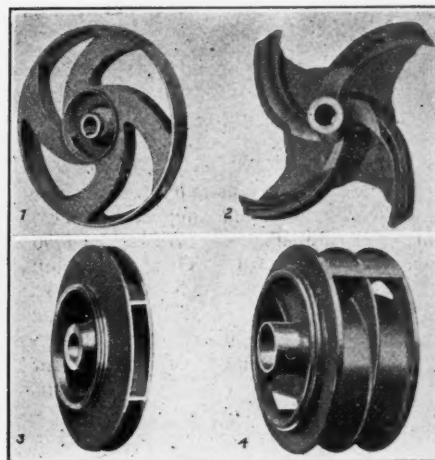
The Morris Pumps are made for all possible drives. The belt-driven double-suction pump has the shell secured in a circular fit, overhanging the base by means of bolts, so that the whole pump shell can be swiveled to different positions within the limits of the bolts. For very large pumps the steam-engine di-

ing off the upper half of the casing when a few bolts are removed.

The illustrations show a twelve-inch three-stage water works pump with horizontally split casing and a sectional view of a three-stage high pressure pump. Four different types of impellers are shown: fig. 1 is a hollow arm piston used in standard water pumps with a four-inch discharge and 470 gallons per minute capacity and larger; fig. 2 is a concave arm wing used in standard water pumps with three-inch discharge and smaller; fig. 3 is an enclosed side-suction impeller used in high-head pumps; and fig. 4 is an enclosed double-suction impeller used in high speed pumps.



TWELVE-INCH THREE-STAGE WATERWORKS PUMP, HORIZONTAL SPLIT CASING.



IMPELLERS FOR MORRIS PUMPS.

THE BUCKEYE-MOBILE.

Low Fuel Consumption Claimed for this Single-Unit Power Plant.

One brake horse-power developed on less than 1½ pounds of coal per hour is the claim for the Buckeye-Mobile—the American locomobile made by the Buckeye Engine Company, Salem, O. The Buckeye-Mobile is really an assemblage into a single unit of the ordinary factors of a high-grade steam plant—a self-contained power plant for effective utilization of high-pressure superheated steam. It consists of an internally fired tubular boiler of the non-return or "gun-boat" type on which is mounted a compound engine of simple construction. A well insulated sheet metal smoke box encloses a tubular superheater, both the engine cylinders, all steam piping and valves and a secondary superheater which heats the steam as it passes from the high to the low pressure cylinder. The engine exhausts through a closed feed water heater into a jet condenser which is provided with a rotary air pump. This air pump and the boiler feed pump are so located as to be readily belt-driven in a very economical way from the engine shaft. This self-contained unit is thus claimed to reduce the fuel consumption, the space requirement and supervision and to be mechanically simple and easy of access for inspection and repairs.

The boiler is of the internal corrugated furnace fire tube type known for its safety and built to carry 225 pounds steam pressure. The furnace, tubes and tube sheets constitute the entire heating

surface and therefore deterioration is well confined to those parts attached by bolts and nuts to the boiler shell and easily removable. Sediment collects in the bottom of the boiler, the coolest part, and therefore can be readily blown off instead of being baked hard. For high-grade low volatile coals the furnace and grate are arranged as shown in the illustration and for high volatile and low-grade fuels an increased grate area is made by an extended furnace. The superheater consists of a single coil of seamless steel tubing through which the steam passes in a direction counter to that of the hot gases. The reheater is built up of a large number of small tubes expanded into headers. The superheater and reheater are suspended from rollers on an overhead track which allows for expansion of piping and affords easy access. The engine is of the compound center crank type and of rugged construction. The bed plate is rigidly bolted at its main bearing to a massive saddle while the guide barrel end rests on a small saddle in which it is free to slide so

that the bed plate is relieved from the effects of boiler expansion. The boiler is provided with a soot blower.

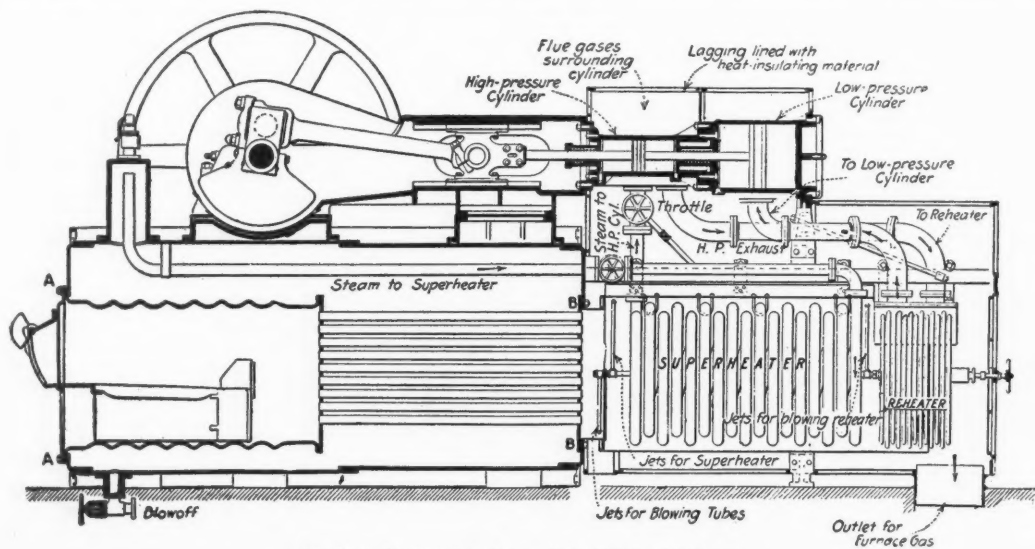
The illustrations show a cross-section of the unit indicating the steam routes and a photograph of a 225 H. P. Buckeye-Mobile. The approximate normal temperatures at various points are given as:

Gases in furnace.....	2,500°
Gases in superheater.....	800°
Gases in smokestack.....	425°
Steam to superheater.....	396°
Steam to H. P. cylinder.....	625°
Exhaust from H. P. cylinder.....	320°
Steam to L. P. cylinder.....	430°
Exhaust from L. P. cylinder.....	140°
Feed water to heater.....	70°
Feed water to boiler.....	125°
Injection water.....	70°
Hot well.....	105°

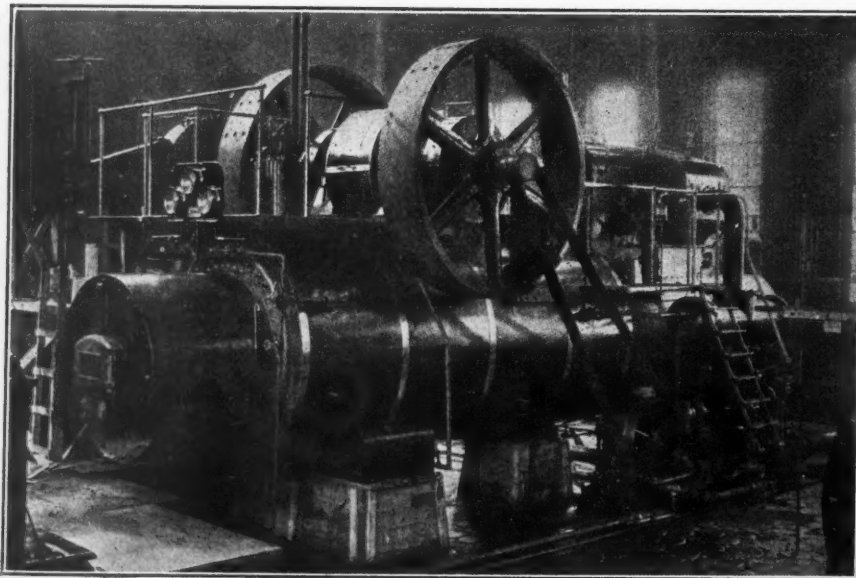
A HOT ROAD ROLLER.

Saves Labor Wasted in Scraping Tar Concrete Picked Up by Cold Rollers.

A very common annoying source of trouble in rolling a tar concrete road surface is that the roller picks up material. Part of the surface is torn up and the material that sticks accumulates more. This gives the surface an uneven appearance. The roller gets



CROSS SECTION OF BUCKEYE-MOBILE.



A 225 H.P. BUCKEYE-MOBILE INSTALLATION.

all lumpy and the laborer wastes a lot of time looking for and using an oil can and scraper. In order to do away with this time-waster the Independent Coal Tar Company, 33 Central street,



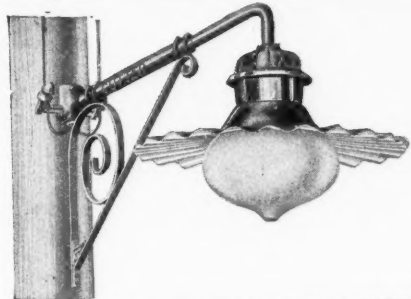
HOT ROAD ROLLER.

Boston, Mass., is making an improved hot roller. This is like an ordinary roller, but has suspended from the axle inside a fire pot. A small fire will keep the roller surface warm so that no tar can be picked up. The hot roller will also give a smoother surface. This roller should certainly prove a money-saver to the contractor in enabling him to get more work out of his labor.

STREETHOODS AND LIGHTING REFLECTORS.

Streethoods and Fixtures for All Circuits and All Sizes and Types of Incandescent Lamps, Including the Nitrogen-Filled Mazda.

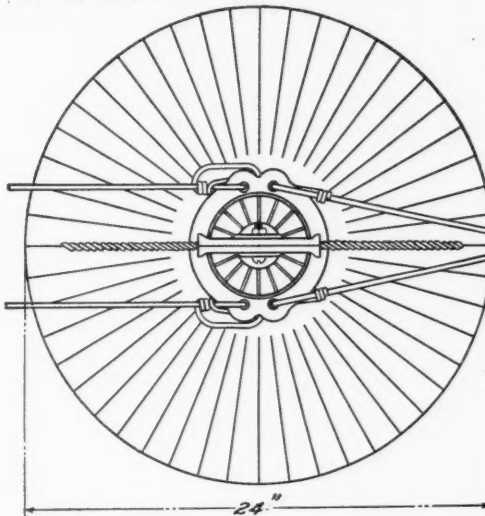
The sizes, shapes and operating characteristics of the new type "C" or nitrogen-filled Mazda lamp, with its



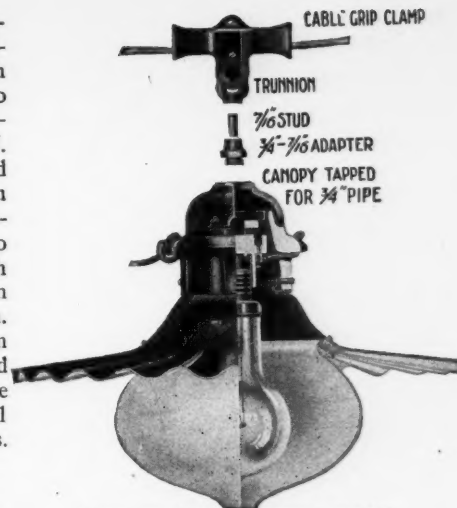
BOULEVARD TELESCOPE BRACKET.

high brilliancy of filament, temperature of bulb and position of light source, necessitate a new design of lighting fixtures. The George Cutter Company, South Bend, Ind., is making a line of streethoods and fixtures adapted especially to the new lamp. The improvements in design may very effectively be used on the older lamps. The interchangeability of the parts makes easy any conversion from one system to another. The Cutter fluted streethood body is made either in one or two pieces. The latter consists of the one-piece hood with an over-hood designed for sleet and snow localities. The streethood has an ornamental iron canopy and fire-enameled reflector

threaded for $\frac{3}{4}$ inch pipe. Ventilation arches around the lower edge allow the circulation of cool air through the porcelain insulator underneath, so that metal parts do not become overheated. The arches are moisture proof. The streethood porcelain is designed for outer or inner wired fixtures. In the new type the cross arm is unnecessary. The line wires are looped into holes in the rim of the porcelain, which is grooved and glazed to protect them from abrasion in case of vibration. Line wires on the center suspension fixtures keep the reflectors cool and prevent swaying in the wind. The bodies are equipped with 20-inch radial wave or 24-inch radial bowl reflectors.



AUXILIARY CABLE TO HOLD THE FIXTURE LEVEL.



ONE PIECE STREET HOOD.

The former is used on small lamps where the filament is not far from the reflecting surface—such as series lamps less than 250 c. p. and multiple lamps less than 250 watts. For larger lamps the larger reflector is used, giving uniform distribution and high efficiency. The Alba diffusing globe used with all lamps above 400 c. p. protects the nitrogen lamp from the weather. The illustrations show the streethood

with the 24-inch reflector and "Boulevard" telescope bracket and the diagram shows the use of an auxiliary cable to hold the fixture level.

The Cutter Company makes brackets, lamp grips, sockets, compensators and other fixtures for street lighting.

ORNAMENTAL LIGHT POSTS.

A Series of Artistic Designs for Lamp Posts for Street Lighting.

The Smyser-Royer Company, of York and Philadelphia, Pa., among the numerous beautifully designed lamp posts and brackets they are making, are putting out several posts that may be used in "white way" systems. The designs are distinctive and striking and should give an artistic system both day and night. Four of these are illustrated. No. 174 has an over-all height of 20 feet, a round base 1 foot 7 inches in diameter and is made with either two or four cross arms designed to hold arc lamps. No. 140 is 10 feet 6 inches high to the bottom of the upper globe, has a base 1 foot 2 inches square and makes a fine classic appearance with its three globes. No. 172 is a dignified five-globe post 11 feet high to bottom of upper globe and a base 1 foot 6 inches square. No. 171 is another five-globe post, 14 feet 6 inches high to base of upper globe, with a round base 1 foot 7 inches across. The Smyser-Royer Company's brackets and posts are widely used in public buildings, this company installing the memorial standards around the City Hall Plaza of Philadelphia.



SMYSER-ROYER ORNAMENTAL LIGHT POSTS.

ADVANCE CONTRACT NEWS

ADVANCED INFORMATION BIDS ASKED FOR

CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS				
O., Delaware	.....10 a.m., June	27..	Macadamizing $4\frac{1}{2}$ miles of road.....	F. C. Higley, Co. Surv.
Ind., Terre Haute	.....June	27..	Concrete	Co. Comrs.
O., Cleveland	.....June	27..	Improving several roads.....	County Comrs.
Wis., Delavan	.....10 a.m., June	27..	Cement curbs and gutters.....	W. H. Horton, Chm. St. Com.
Mont., Billings	.....2 p.m., June	27..	Grading and paving two roads.....	F. E. Williams, Clk. Co. Comrs.
O., Cleveland	.....10 a.m., June	27..	Improving five roads, three jobs.....	E. G. Krause, Co. Clk.
O., Marion	.....Noon, June	27..	Grading, rolling and macadamizing one road.....	County Surveyor
O., Nova	.....Noon, June	27..	Grading, draining and bituminous bound macadam on $4\frac{3}{4}$ miles road.....	Township Trustees
Wash., Shelton	.....June	27..	Constructing permanent highways.....	County Comrs.
Ind., Columbus	.....10 a.m., June	27..	Constructing roads in three townships.....	P. D. Sader, County Aud.
Pa., Scranton	.....June	27..	Constructing municipal asphalt repair plant, capacity 1,500 sq. yds., cost \$18,000.....	J. G. Hayes, Director
Ia., Marshalltown	.....June	27..	Grading and boulevarding on one street.....	J. J. Wilson, C. C.
Wis., Clearfield	.....2 p.m., June	27..	Filling, grading and ditching.....	M. Hansen, Chr. Town Board
O., Cambridge	.....About July	28..	Paving various streets	G. B. Clark, Dir. P. S.
Wash., Olympia	.....June	29..	Surfacing with crushed rock, about 4 miles.....	State Highway Bd.
Md., Belair	.....June	29..	Constructing 2.85 miles of state aid road.....	W. A. Wheeler, Clk. Co. Com.
W. Va., New Cumberland	.....June	29..	Laying 4 miles of brick pavement, cost \$40,000.....	E. Grafton, Co. Engr.
Minn., Duluth	.....10 a.m., June	29..	Paving and otherwise improving alley.....	C. S. Palmer, Clerk
Tex., Houston	.....10 a.m., June	29..	10,000 cu. yds. of shell and grading 5 miles.....	County Commissioners
O., Elmore	.....Noon, June	29..	Paving, etc., on one street.....	W. Haley, Vil. Clk.
Wis., Dodgeville	.....7 p.m., June	29..	About 30,000 sq. ft. cement walk.....	J. P. Lewis, C. C.
N. D., Fullerton	.....Noon, June	30..	Constructing drain grade, 30 rods long.....	R. Applequist, Clerk
Ind., Indianapolis	.....10 a.m., June	30..	Grading, draining and improving highway.....	W. T. Patten, Co. Aud.
O., Niles	.....Noon, June	30..	Paving various streets with brick or Tarvia macadam.....	J. N. Cowdery, Dir. P. S.
Tex., San Antonio	.....June	30..	Grading and graveling three roads.....	Co. Auditor.
Ark., Star City	.....10 a.m., June	30..	Constructing 22 miles of macadam, gravel or rock and gravel highways	Board of Comrs.
Cal., Dan Diego	.....June	30..	46.21 miles of grading and tunnelling.....	E. J. Kallright, Ch. Engr.
Ind., Sullivan	.....7.30 p.m., June	30..	Paving three streets	J. M. Dudley, City Clk.
O., Portsmouth	.....Noon, June	30..	Paving with brick and tar filler, distance of 7,975 ft.....	G. S. Wilhelm, City Engr.
Ind., South Bend	.....10 a.m., June	30..	Constructing sidewalk, curb and grade.....	Board Public Works
N. J., Linden	.....8 p.m., June	30..	Macadamizing four streets.....	C. H. Smith, Boro. Clerk
Utah, Ogden	.....10 a.m., June	30..	Constructing asphalt pavement on concrete base.....	F. O. Stanford, City Recorder
O., Marion	.....noon, June	30..	Constructing paving and sandstone sidewalks.....	H. C. Cass, Dir. P. S.
O., Shelby	.....June	30..	Grading, draining, curbing 3,100 sq. yds., either brick, water-bound macadam or bitumen macadam.....	C. A. Schikler, City Engr.
S. D., Alexandria	.....July	1..	Five miles of grading.....	County Auditor.
Ill., Springfield	.....Noon, July	1..	Constructing state-aid road, cost about \$21,629.....	State Highway Comm.
Ill., Rock Island	.....July	1..	6,690 sq. yds. asphalt pavement and 4,880 ft. concrete curb and gutter, cost \$7,710.....	H. Schreiber, Mayor
O., Homerville	.....3 p.m., July	1..	12,114 sq. yds. waterbound macadam.....	Township Trustees
Ill., Chicago	.....11 a.m., July	1..	Constructing cement sidewalk.....	Board Local Improvements
O., New Philadelphia	.....Noon, July	1..	Improving one street	J. E. Scott, Dir. P. S.
Ill., Springfield	.....Noon, July	1..	Constructing brick and concrete highway.....	A. N. Johnson, State Highway Engineer
Ind., Fort Wayne	.....10 a.m., July	1..	Constructing stone road.....	C. H. Brown, County Aud.
O., Dayton	.....11 a.m., July	1..	Repairing several miles of road.....	County Commissioners
N. J., Newark	.....3 p.m., July	1..	Repairing, widening and resurfacing turnpike.....	F. A. Reimer, Co. Engr.
N. Y., Brooklyn	.....11 a.m., July	1..	Cement sidewalks, curbing, asphalt pavements on concrete foundation	L. H. Pounds, Boro. Pres.
Ia., Dubuque	.....8 p.m., July	2..	Asphalt concrete on concrete foundation, 1,428 sq. yds.; 593.2 ft. cement curb.....	J. J. Shay, City Rec.
N. Y., Corning	.....Noon, July	2..	Paving two streets about 17,000 sq. yds. (See Proposal ad.).....	W. O. Drake, Supt. P. W.
Ind., Evansville	.....July	2..	Concrete road in two townships.....	County Commissioners
Ind., Marion	.....10 a.m., July	2..	Furnishing 8,000 more or less gallons of Tarvia or equal.....	County Comrs.
N. J., Woodlynne	.....8.30 p.m., July	2..	1,400 sq. ft. of cement sidewalk and 300 ft. cement or stone curbing	L. E. Rupertus, Dis. Clk.
Pa., Conemaugh	.....July	2..	Road construction	O. P. Thomas, Engr., Johnstown.
O., Hicksville	.....July	2..	Paving 20,000 sq. yards.....	O. P. Bevington, Clerk.
N. J., Freehold	.....11 a.m., July	3..	Resurfacing one road.....	Co. Engineer, G. D. Cooper, Redbank
Ky., Louisville	.....2 p.m., July	6..	Constructing several vitrified block pavements.....	Board Pub. Works
Ind., Tipton	.....July	6..	Three gravel roads.....	G. H. Transberger, Co. Aud.
Ind., Newport	.....10 a.m., July	6..	Gravel	Roy Slater, Co. Aud.
Cal., East San Diego	.....July	6..	Improving portions of street by curbing, sidewalk and paving	City Clerk
Miss., Forest	.....11 a.m., July	6..	Six miles	W. A. Turner, Sec. Hwy. Comm.
N. J., New Brunswick	.....July	6..	Paving one street	City Clerk.
N. Y., Albany	.....1 p.m., July	6..	Improving highways in a number of counties. (See proposal ad.).....	J. N. Carlisle, Comr.
N. D., Mohall	.....2 p.m., July	6..	Three grading jobs	Carlson, Auditor.
Mont., Roundup	.....July	6..	Constructing cement crosswalks.....	City Clerk.
Md., Easton	.....July	6..	Paving about 20,000 sq. yds.....	F. C. Costenbarger, Jr., Ch. Eng.
Ind., Greencastle	.....2 p.m., July	6..	Constructing 7,235.15 ft. of gravel road.....	C. L. Airhardt, Co. Aud.
Ia., Manning	.....July	6..	Paving 24,000 sq. yds. and 6,600 ft. artificial stone curbing.....	City Council.
N. J., Elizabeth	.....July	6..	Paving several streets with brick and flagging.....	W. P. Neafsey, St. Comr.
Ind., Rensselaer	.....2 p.m., July	6..	Constructing one township road.....	J. P. Hammond, Co. Aud.
Ind., Hartford City	.....2 p.m., July	6..	One macadam road.....	County Auditor
Ind., Salem	.....1.30 p.m., July	6..	One township road.....	F. S. Numbkeldt, Auditor.
Miss., Tupelo	.....Noon, July	6..	Grading and surfacing with gravel, $\frac{1}{2}$ mile.....	E. W. Robins, Hwy. Comr.
Ind., Kentland	.....1 p.m., July	6..	Grading and paving, three jobs.....	County Comrs.
O., Cleveland	.....Noon, July	6..	Grading, etc.....	Clerk Bd. Education.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Ind.	Monticello	10 a.m., July	7..Grading and paving, four jobs.....	County Comrs.
Kan.	Manhattan	.....July	7..2½ miles of cement sidewalks, 4-in. base and ½-in. top..	City Clerk
Ind.	Logansport	10 a.m., July	7..One township road.....	C. E. Medland, Auditor
Ind.	Crawfordsville	10 a.m., July	7..One township road.....	B. B. Engel, Auditor
Ind.	Vincennes	11 a.m., July	7..Constructing one road.....	J. T. Scott, Auditor
Ind.	Lawrenceburg	Noon, July	7..One township concrete road.....	W. S. Fagaly, Auditor
Ind.	Kokomo	10 a.m., July	7..Three roads in one township.....	E. B. Swift, Auditor
Ind.	Lebanon	1 p.m., July	7..One gravel road.....	D. M. Clark, Auditor
Ind.	Madison	1.30 p.m., July	7..Gravel road in two townships.....	A. M. Taff, Auditor
Ind.	Rockville	11 a.m., July	7..Constructing several gravel roads in county.....	J. E. Elder, Co. Aud.
Wash.	Pullman	.....July	7..Paving streets.....	L. V. Edwards, City Eng.
Ky.	Burlington	.....July	7..20 miles of macadam road with bridges.....	City Clerk
Minn.	New Ulm	5 p.m., July	7..15,000 sq. yds. of paving, and about 4,000 ft. curbing, catch basins, etc.....	W. Backer, C. C.
S. D.	Wheeler	2 p.m., July	8..Grading number of highways.....	F. J. Kaberna, Co. Auditor
Tex.	Corpus Christi	4 p.m., July	8..Constructing concrete retaining walls, ballast stairways, sidewalks, curbs and gutters, etc.....	F. J. Mulligan, City Sec'y
Fla.	Fernandina	10 a.m., July	8..One five-ton road roller, one light road grader, one 30 H. P. traction engine, eight wagons and galvanized culvert pipe.....	Board County Comrs.
N. Y.	Binghamton	.....July	8..Constructing brick pavement on four streets.....	City Clerk
N. D.	Williston	.....July	9..About 60,000 cu. yds. of earthwork in road improvements.....	J. C. Field, Co. Surv.
O.	Dayton	10 a.m., July	9..Paving floors of several bridges with creosoted Hex blocks.....	County Comrs.
Ind.	Crown Point	.....July	9..Gravelling several roads.....	County Board Comrs.
Fla.	Tampa	10 a.m., July	10..Improving one city road.....	W. P. Culbreath, Clerk.
O.	Cincinnati	Noon, July	10..Repairing pike 5,000 ft. and improving one road.....	County Comrs.
O.	Columbus	Noon, July	10..Constructing roadway on bridge.....	Franklin Co. Comrs.
Ind.	Brownstown	10 a.m., July	11..Gravel road.....	E. W. Edwards, Co. Aud.
Wis.	Marinette	2 p.m., July	11..Constructing macadam pavement.....	A. H. Holquist, Chr. B. P. W.
Minn.	Lake Falls	2 p.m., July	13..Ten miles road construction.....	G. DuPont, Co. Auditor
Minn.	Worthington	2 p.m., July	13..Grading, graveling and turnpiking nine concrete culverts, cost \$3,686.....	G. Swanberg, Co. Aud.
N. J.	Perth Amboy	2.30 p.m., July	13..Concrete pavement, distance, 3,260 ft.....	Ed. Chosen Freeholders
Minn.	Shakopee	10 a.m., July	13..Road culverts.....	A. J. Meyer, Co. Auditor
O.	Shaker Heights	Noon, July	14..Grading, draining, curbing and paving with brick, concrete, asphalt or bituminous macadam.....	C. A. Palmer, Village Clk.
O.	Wauseon	1 p.m., July	14..Road improvements.....	Comms. Henry & Fulton Cos.
O.	Bowling Green	1 p.m., July	14..Grading, draining and macadamizing, also applying tar and bituminous binder.....	C. E. Stinebaugh, Co. Aud.
O.	Springfield	10 a.m., July	14..Installing new creosoted wood block on several bridges.....	County Commissioners
Minn.	Buffalo	2 p.m., July	15..Grading and graveling two roads.....	J. A. Berg, Co. Aud.
Miss.	Tupello	noon, July	16..Furnishing and constructing culverts and surfacing either with gravel or concrete about 47 miles of h'way.....	E. W. Robins, Hwy. Comr.
O.	Cincinnati	Noon, July	17..Constructing three miles of road.....	County Commissioners
Ind.	Shelbyville	11 a.m., July	18..Grading, draining & graveling highways in two counties.....	Comrs. of Decatur & Shelby County
Ind.	South Bend	11 a.m., July	30..3,700 ft. of gravel road improvement.....	C. Sedgwick, Co. Aud.
SEWERAGE				
Canada,	Sarnia, Ont.	Noon, June	27..Constructing a 2-mile drain.....	M. Carrick, Township Clk.
Mich.	Bay City	9 a.m., June	29..Constructing 30 to 36-inch reinforced concrete socket tile sewer.....	Board Public Works
N. Y.	Albany	.....June	29..Imhoff tank, outfall sewers and drying beds.....	Board Con. & Supply.
Tenn.	Fayetteville	2 p.m., June	30..Sanitary sewer system.....	Bd. of Aldermen.
La.	New Orleans	noon, July	30..Wire and cables for drainage system.....	F. S. Shields, Sec. Water Bd.
Ia.	Montezuma	.....June	30..Constructing sanitary sewer of vit. clay tile 6-12-inch diameter.....	Town Clerk
Ia.	Creston	About June	30..1,100 ft. 12-in., 2,890 ft. 10-in., 8,622 ft. 8-in. and 12,930 ft. 6-in. vit. pipe sewer.....	J. F. Golden, City Clerk
Kan.	Topeka	.....June	30..Sewer construction, three districts.....	A. R. Young, City Engr.
Wis.	Merrill	.....June	30..3,071 ft. of brick and concrete sewers and 5,685 ft. of 12-24-inch tile sewers.....	City Clerk.
Wis.	West Allis	2 p.m., July	1..Building addition to sewage disposal plant.....	E. C. Orbert, City Engr.
Pa.	York	.....July	1..Constructing outfall sewer, consisting of 2,560 ft. of 42-inch and 5,260 ft. of 60-inch brick or concrete sewer.....	G. Warner, City Engr.
Ind.	Riverside City	.....July	1..Constructing sewers in various streets.....	J. E. Fouts, City Clerk
Mo.	Charleston	7 p.m., July	2..Sewerage system and sewage disposal plant.....	City Clerk
Tex.	San Antonio	4 p.m., July	6..Constructing storm and sanitary sewers.....	H. Helland, City Engr.
Wis.	Reedsburg	7.30 p.m., July	6..Lateral sewer on two streets.....	W. A. Dierken, City Clerk
Mont.	Choteau	6 p.m., July	6..Sanitary sewer and disposal plant (see proposal ad).....	S. L. Powers, Town Clerk
N. J.	Plainfield	.....July	6..Constructing sanitary sewers.....	J. P. McMurray, City Clk.
N. Y.	White Plains	8 p.m., July	6..Constructing lateral sewer.....	J. J. Brown, Pres.
Neb.	Fremont	7.30 p.m., July	6..Constructing sanitary sewer.....	J. Gumb, Chr. B. P. W.
Wis.	New London	8 p.m., July	7..Sewers in several streets.....	C. J. Thompson, City Clk.
Md.	Frederick	11 a.m., July	7..850 ft. 6 to 18-inch sewer.....	L. H. Fraley, Mayor
O.	Sandusky	Noon, July	7..Sewage treatment plant.....	J. J. Molter, Dir. Pub. Serv.
O.	Marion	Noon, July	8..Constructing sanitary sewer and cellar drain.....	H. C. Cass, Dir. P. S.
Minn.	Bemidji	11 a.m., July	8..Constructing a judicial ditch.....	D. J. Bourgeois, Engineer
N. D.	Carrington	7.35 p.m., July	10..Extension of sewer mains.....	G. W. Heinmiller, City Engr.
Kan.	Eldorado	.....July	10..100 ft. 12-inch and 18-inch storm sewer.....	B. F. Allenbach, City Clk.
S. D.	Aberdeen	10 a.m., July	13..1,465 ft. of eight-inch sewers and two manholes.....	F. W. Raymond, City Aud.
O.	Columbus	Noon, July	13..Constructing sewage disposal plant and sanitary sewer.....	John Sott, Clk. Co. Comrs.
Ia.	Guthrie Centre	.....July	14..Sewer work to cost about \$3,700.....	S. B. Weeks, City Clk.
D. C.	Washington	2 p.m., July	14..Furnishing and delivering electrically-operated centrifugal sewage pumps.....	District Comms.
N. J.	Newark	2 p.m., July	14..Construction Section 12 of main intercepting sewer.....	Passaic Valley Sew. Com.
O.	Sandusky	.....Aug.	14..Constructing one mile ditch.....	L. A. Schultz, Engr.
O.	Steubenville	Noon, July	14..Constructing sewers.....	County Commissioners
O.	Columbus	Noon, July	14..Constructing sewage disposal plant & system of sanitary sewers.....	County Commissioners
Neb.	Stanton	8 p.m., July	14..Sewer work.....	W. T. McFarland, City Clk.
Fla.	Daytona	.....July	15..21 miles 8-24-inch vit. pipe sewer, 430 tons c. i. pipe, 16,000 ft. galv. iron pipe, etc.....	Bd. Pub. Works
Mont.	Havre	8 p.m., July	20..Constructing five miles of sewer, filtration and disposal plant.....	S. L. Hanley, City Engr.
Ind.	Hammond	10 a.m., July	31..12-inch vit. socket pipe sewer.....	Board Public Works
WATER SUPPLY.				
Ill.	Rockford	.....June	27..Drilling one well.....	Supt. Water Supply
S. C.	Port Royal	11 a.m., June	27..1 boiler feed water purification system.....	H. R. Stanford, Bur. of Yards & Docks, Washington, D. C.
Minn.	Canton	7.30 p.m., June	29..Constructing water works system complete.....	W. A. Dierken, City Clerk
Mass.	Framingham	.....June	29..Laying about 9,780 ft. 12-18-inch c-i. water pipe.....	J. Van Valkenburgh, Eng.
Tex.	Fort Bliss	11 a.m., June	30..Extending water works system.....	W. E. Hunt, Depot Q. M., El Paso
N. Y.	Sidney	.....about July	1..Constructing water works, cost \$125,000.....	Village Clerk.
Mo.	Charleston	.....July	2..Constructing water works, sewerage system, sewage treatment works, etc.....	Mayor
Panama	.....July	.....July	6..C-i. pipe fittings, valves, etc.....	Gen. Pur. off., Wash., D. C.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Ia., Perry	July	6..	Furnishing and laying 2,000 ft. of 4-inch main	City Clerk
Neb., Herman	Noon, July	6..	Constructing waterworks system complete	Village Board Trustees
Ia., Keystone	Noon, July	6..	Extending waterworks system	G. Harder, Town Clerk
S. D., Humboldt	July	10..	Constructing water works, cost \$10,000	S. Edmunds, Engr., Yankton.
N. D., Carrington	7.35 p.m., July	10..	Extending water mains	H. L. Winterer, City Clk.
N. Y., New York	11 a.m., July	14..	Roofing with reinforced concrete tile 46 superstructures along Catskill aqueduct	Comrs. Water Supply, Municipal Bldg.
S. D., Tripp	July	15..	Sewers and sewage treatment plant	Dakota Engrg. Co., Mitchell
Neb., Dalton	Aug.	27..	Constructing water works, cost \$7,200	J. L. Willis, Village Clk.
LIGHTING AND POWER.				
S. C., Port Royal	June	27..	Furnishing and installing boiler feed water purification system	Bureau Yards & Docks, Navy Dept., Washington, D. C.
Ind., Evansville	10 a.m., June	29..	Lighting streets with electric arc and incandescent lights for optional period of years	Board of Public Works.
Kan., Powhattan	About June	30..	Electric light transmission line and distributing system	L. C. Christenson, City Clerk
Minn., Moorhead	8 p.m., June	30..	Electrical machinery	R. G. Price, City Clk.
Fla., Punta Gorda	June	30..	Fully equipping electric light plant	J. F. Corbett, Clk. Bd. Bond Trus.
Man., Winnipeg	11 a.m., June	30..	Switchboard and other apparatus for fire alarm office equipment	City Electrician
O., Mansfield	m., July	1..	Electric street lights for 10 years	O. Hursh, Dir. Pub. Serv.
Pa., Lansdale	July	1..	Supplying mazda lamps, copper wire, bolts, braces, asbestos, etc.	Chr., Elec. Light Dept.
Sask., Estevan	July	1..	Erecting electrical machinery, generators, three gas engines and switchboard	G. Bethridge, Town Elec Engr.
Ill., Chicago	11 a.m., July	1..	Furnishing & installing electrical equipment for bridge	L. E. McGann, Comr. P. S.
O., Cincinnati	noon, July	1..	Supplying underground alloy-covered cable	E. Von Barden, Pur. Agt.
Ill., Edwardsville	10 a.m., July	2..	Installing heating and ventilating system and vacuum system in county court house, and erecting boiler house and tunnel	H. J. Mackinaw, Co. Clk.
Ia., Dubuque	July	2..	Providing changes in plumbing cond't and wiring system	Superv. Arch., Wash., D. C.
Ariz., Tucson	4 p.m., July	6..	60 5-light and 26 1-light ornamental street lighting standards, with globes or bulbs	L. O. Cowan, City Clerk.
Md., Easton	noon, July	8..	Engine, generators and power plant equipment	C. H. Henry, Sec. Easton Elec. Commission
Pa., Tarentum	July	13..	Reinforced concrete power house	Borough Council.
FIRE EQUIPMENT.				
O., Elyria	June	29..	Furnishing tractor for a 65-ft. aerial truck and motor police patrol	S. H. Squire, Dir. Pub. Serv.
Man., Winnipeg	June	30..	Switchboard and apparatus for fire alarm	Chman. Bd. Control.
Mont., Missoula	July	1..	500 feet hose	L. E. Harris, City Clerk
Fla., Jacksonville	8 p.m., July	6..	Furnishing 2,500 ft. 2½-inch rubber-lined fire cotton hose	F. Richardson, City Bd. Bond Trustees.
Mont., Kalispel	July	10..	Supplying motor apparatus	P. R. Neilson, Chief
Mont., Havre	8 p.m., July	20..	Furnishing combination hose and chemical motor car	S. L. Hanley, City Engr.
BRIDGES.				
Ill., Bunker Hill	1 p.m., June	29..	Three reinforced concrete bridges	State Hwy. Comm., Springfield
Pa., Hollidaysburg	Noon, June	30..	Constructing 11 reinforced concrete bridges	W. S. Hostler, Co. Clk.
N. J., Elizabeth	2.30 p.m., July	1..	Constructing reinforced concrete arch bridge	J. L. Bauer, Co. Engr.
Colo., Colo. Springs	Noon, July	2..	Reinforced concrete bridge	E. C. Shelden, Co. Clk.
Ind., Hartford City	2 p.m., July	6..	Furnishing all material and constructing a cement concrete culvert	J. Cronin, Jr. Aud. County.
Ont., Toronto	Noon, July	7..	Concrete retaining wall, bridge floor and conc. abutment	Board Control
Ind., Indianapolis	10 a.m., July	7..	Two flat top culverts	County Commissioners
Kan., Washington	Noon, July	10..	Constructing 13 bridges, 20 to 50 ft. in length	F. E. McKelby, Co. Clk.
Ariz., Phoenix	Noon, July	13..	Constructing 25-ft. span reinforced concrete bridge	J. Miller, Jr., Clk. Bd. Supv.
O., New Philadelphia	July	15..	Constructing a 100-ft. concrete arch bridge	R. H. Misstofer, Aud.
MISCELLANEOUS.				
O., Cincinnati	noon, July	1..	Furnishing three 20 h.-p. auto runabouts	P. Fostick, Dir. P. S.
Ill., Chicago	1 a.m., July	2..	Furnishing three motor-driven hoists	L. E. McGann, Comr. P. S.
D. C., Washington	10.30 a.m., July	6..	Furnishing c. i. pipe, fittings, valves, etc.	Maj. F. C. Boggs, Gen. Pur. Off. Isthmian Canal Comm.
N. J., Bloomfield	8 p.m., July	6..	Eight-room fireproof school building, cost \$45,000	Board of Education
Fla., Jacksonville	8 p.m., July	6..	Furnishing \$750 automobile	Board Bond Trustees
Ia., Muscatine	2.30 p.m., July	8..	Furnishing all material and constructing fireproof City Hall	Ch. Kern, Mayor.
N. H., Portsmouth	July	11..	Furnishing and installing after-cooler	Bureau Yds. and Docks, Navy Dept., Wash., D. C.
O., Cincinnati	Noon, July	13..	Constructing concrete retaining wall	C. W. Handman, Bus. Mgr.
N. Y., Hudson	7.30 p.m., July	22..	Furnishing material and labor for waterproofing old wall and constructing 6-in. reinforced concrete cutoff wall. (See proposal ad)	M. J. O'Hara, Cty Eng.
Ia., Le Mars	3 p.m., July	23..	Constructing complete post office	O. Wenderoth, Sup. Arch., Treasury Dept., Wash., D. C.

STREETS AND ROADS

Town Creek, Ala.—Town Creek has been awarded state appropriation of \$2,000 to be supplemented by like sum from county, to be used on pike between Town Creek and Courtland. This sum is to be augmented by private subscriptions by citizens of two towns to amount of something like \$2,000, which added to state and county appropriations will aggregate about \$6,000.

Bakersfield, Cal.—State highway bonds to the amount of \$180,000 have been ordered purchased by board of supervisors. Bonds cover expense of building state highway from point thirteen miles south of Bakersfield to Rose Station.

Sacramento, Cal.—The opening up of good highway from Santa Clara Valley into the beautiful California Redwood Park near Santa Cruz was assured when Professor C. B. Wing of Redwood Park

Commission informed Board of Control that all necessary rights of way have been granted. This releases \$70,000 appropriation granted by last Legislature for rebuilding of road. Road will run from Saratoga Summit to California Redwood Park, distance of eighteen miles.

Napa, Cal.—People of Redwoods road district have voted to tax themselves to construct macadam roads. Tax rate will be \$2.50 on the \$100 of assessed property, but farmers want better roads, and will build them.

Oakland, Cal.—Resolutions calling for bids for work of Dept. of Streets during next fiscal year, 1914-1915, have been adopted by City Council. Bids for following were called for: Oiling streets, supplying and spreading road oil, sewer pipe, rock and screenings, and necessary labor and material for repair of asphalt and bituminous pavements.

Oakland, Cal.—City Council has adopted ordinance ordering opening and ex-

tending of Sixty-Second Ave. from Foothill Park to Avenal Ave., and also adopted plans and specifications for improvement of Twenty-third Ave. between East Twenty-second and East Twenty-ninth Sts.

Oakland, Cal.—City Council has directed City Engineer Brown to prepare proceedings for improvement of 78th Ave. south of East 14th St., and passed ordinance ordering opening and extending of 62d Ave. from Foothill Park to Avenal Ave.

Stockton, Cal.—The City Council has passed resolutions providing for great municipal street improvements under proposed bond issue, according to plans and estimates prepared by City Engineer H. T. Compton. The improvements will cost \$266,400.

Visalia, Cal.—J. F. Gibson of Visalia, W. P. Boone of Dinuba and N. W. Ball of Porterville, have been appointed members of Tulare County Highway Com-

mission by Board of Supervisors. Commission will proceed at once to complete system of permanent roads and estimate cost of same. It is expected to call for bond issue in August, if possible.

Stamford, Conn.—Bids for amiesite pavement on Shore Rd. have been received, but as appropriation called for \$2,500 and Gregory & Merritt, lowest bidder, was \$3,129.25, it will probably be necessary to call for new bids. Daly & Merritt's bid was \$3,150.50.

Stamford, Conn.—That West Main St., from bridge west to point near Fairfield Ave., will be paved with Hassan type of pavement, has been practically decided by Street Committee. Cost of this pavement will be about \$1.50 per yard.

New Castle, Del.—County Engineer Wilson has suggested that \$50,000 be appropriated for upkeep of improved roads throughout New Castle Co.

Aledo, Ill.—Mercer Co. Board of Supervisors have voted to build 3 miles of hard highway out of Aledo. State funds in sum of \$10,169 are available, providing county appropriates like sum.

Alton, Ill.—Plans are being discussed for paving of Front St.

Canton, Ill.—According to County Superintendent of Highways E. F. Motzinger, at least eight weeks will be required in preliminary work before active building of state-aid Fulton county roads in Canton township can begin. Resolutions adopted by board of supervisors designating certain roads to be improved, will have to go to state highway commission for approval. In event that board approves selection of supervisors, survey will be made and plans and specifications prepared, together with estimate of cost of improvement.

Ottawa, Ill.—Board of Supervisors has finally decided to ask State Highway Commission for estimates for construction of state-aid roads in La Salle county.

Springfield, Ill.—State highway commission has sent out approval of specifications for several miles more of state aid roads, advertisements for which will be inserted at once in order that bids may be let on July 1, should supreme court hold highway act constitutional. Brick roads will be built in several counties as follows: Ogle, 3,500 feet; Vermilion, 16,100 feet; Edgar, 4,200 feet in one road and 4,500 in another; Bond, 1,575 feet. Concrete roads will be built as follows: Iroquois, 13,306 feet and 15,000 feet; Clark, 4,500 feet; Crawford, 18,049 feet; Franklin, 4,378 feet; Schuyler, 5,400 feet; Sangamon, 3,500, 2,200, 4,400, 2,200, 2,350 feet; DeKalb, 6,009 feet, and 15,723 feet; Lake, 10,600 feet.

Waukegan, Ill.—It has been decided to resurface more macadam streets in city, resolution for which improvement was presented to board of local improvements. Streets included in new improvement are Julian street from east side of Julian street to Genesee street; and Genesee street from north line of Grand avenue to a point just north of Franklin street. Estimated cost of improvement is \$3,424.49.

Columbus, Ind.—Bonds for two Bartholomew county roads have been sold. An issue of \$10,400 for Gosch road was bought by First National Bank of this city at premium of \$75. Issue of \$10,640 for Crim road was sold to Breed, Elliott & Harrison, of Indianapolis, at premium of \$88.

Huntington, Ind.—According to decision of town council of Roanoke four streets in Roanoke will be paved during summer months. One street will be paved with concrete, while three other streets will be paved with brick.

Sullivan, Ind.—City Council has passed resolution providing for paving of Snow, Broad and Depot Sts. Council has passed a resolution providing for paving of North Section St., between Jackson and Snow Sts.

Washington, Ind.—County Treasurer John L. Clark has sold to Washington National Bank of this city, \$1,000 of 4½ per cent., ten-year gravel road bonds. Only one bid was received.

Mulberry, Kan.—Purchase of street sprinklers is being urged.

Louisville, Ky.—Bids for several pieces of sidewalk construction, ranging from 72 to 74 cents per yard, have been opened by Board of Public Works, and contracts will be awarded later. Bidders were American Concrete Construction Co., both sides of Everett Ave., from Highland Ave. southeast; Roscoe Butner, both sides of St. Catherine St., from 6th St. to 8th St.; west side of Midland Ave., from Cherokee Rd. to Everett Ave.

Anna, La.—Police jury of St. Charles parish has called special election for July 14 in road district No. 3 to secure vote on proposition to incur indebtedness of

\$110,000 for building good roads through St. Charles parish from Jefferson line to St. John, on New Orleans side of river.

Sag Harbor, L. I.—Clerk James A. Early of Suffolk County Board of Supervisors, has received from Commission of Highways at Albany, plans of connecting link of state highway, between East Hampton and North Haven Rds. They will be placed before next meeting of Supervisors for approval, and it is expected bids will be advertised for building road by latter part of this month. Road runs through incorporated village of Sag Harbor for distance of 2 miles.

Cumberland, Md.—Election will be held July 14 for voting on bond issue of \$150,000 for paving streets within limits of city.

Haverhill, Mass.—It has been decided that following streets will be repaired: Broadway, \$3,200; Washington St., Washington Sq. and Bridge St., \$4,200; Johnson St., \$1,270; Lakeview Ave. (gravel), \$2,600; one-half of Lawrence St., \$4,225; Prospect St., Bradford district, \$2,750; Washington St., from Beach St. to end of car line (gravel), \$2,700; Sheridan St., \$3,800; Westland Ter., \$2,560; Mill St., \$4,500; Newcomb St., \$3,400.

Pittsfield, Mass.—Sum of \$4,000 is recommended for grading and widening of Fourth street.

Quincy, Mass.—Heavy expenditures for street improvements have been provided in budget submitted to Quincy City Council. Items follow: Roslin avenue, \$2,500; Davis street, \$3,500; Winthrop street, \$5,000; Park lane, \$1,800; Edison street, \$400; Hucks avenue, \$4,000; Glendale road, \$600; Montclair avenue, \$4,000; Hamilton street, \$1,700; Green street, \$2,000; footway on Saville street, \$1,400; Apthorp street, \$3,000; Federal avenue, \$2,700; Dysart street, \$2,700; Phillips street, \$2,900; rebuilding Hancock street, between Granite and School streets, and granolithic sidewalks, \$30,500.

Kalamazoo, Mich.—City bond commissioner has authorized advertising for bids on city improvement, street improvement, and sewer bonds, amounting to \$96,000. Bids must be in before 11 o'clock a. m., June 22.

Duluth, Minn.—Property owners on Victoria St. between Woodland Ave. and Hartley Rd. have presented petition to Commissioner Murchison asking that street be paved with concrete to width of 16 feet.

Joplin, Mo.—Paving of Main street from Tenth to Twenty-third streets and from Broadway to Third street probably will come before city council.

Fallon, Nev.—The Churchill County Chamber of Commerce has appointed committee to have proposal for a \$50,000 Lincoln Highway bond issue put on November ballots.

Sparks, Nev.—On petition of 100 citizens, asking that street and sewer bonds of \$25,000 be authorized, bond election has been set by City Council for July 18.

Atlantic City, N. J.—Board of Freeholders has approved plans and specifications for paving of Meadow Boulevard. Plans will now be sent to State Department of Roads and if they receive their sanction, work is expected to start at once. Specifications call for hard paving 30 feet wide all way across meadows and it is estimated that this improvement will cost about \$135,000. On both sides of paved strip will be 15 feet of gravel road for heavy traffic while paving is to be used by automobiles.

Linden, N. J.—Voters of Linden will pass on proposition to issue bonds to amount of \$150,000 for street improvements at special election to be held July 22.

Newark, N. J.—Bids for repairing and resurfacing Pompton turnpike, from Bloomfield avenue to Passaic County line, will be asked for by Board of Freeholders. This was decided after communication had been received from State Road Commissioner Stevens, which stated that \$40,000 had been reserved for Essex County out of motor vehicle fund.

Perth Amboy, N. J.—Assured by State Road Commissioner Stevens that city would receive \$15,000 for improvement of Amboy and New Brunswick Aves., officials will push work on those thoroughfares and make plans for permanently paving them in sections.

Plainfield, N. J.—Ordinance has been adopted on first and second reading providing for improvement of Emerson avenue, Geraud avenue, Monroe avenue, a part of West Fourth street and Berkeley avenue, and providing for issuance of \$16,000 in bonds to pay for same.

Trenton, N. J.—Ordinances have been adopted for improvement of various streets. Frank Thompson is City Clerk.

Buffalo, N. Y.—Plans for new stretch of good road in town of Holland, known as Holland-Glenwood Rd., have been received from State Highway Commission and referred to good roads committee. Road will cost \$61,000.

Ithaca, N. Y.—Contract for construction of nearly mile of concrete curbs and gutters has been awarded to William Pritchard by Board of Public Works. Price at which work was awarded was twenty-one cents per running foot for curb, sixteen-inch gutters and twenty-four and one-half cents for curb and twenty-four-inch gutters, city to furnish cement.

Columbus, O.—Improvement of Main street is urged; estimated cost, \$30,000.

Columbus, O.—Resolution declaring it necessary to repave Main St. from High to Parsons Ave. has been adopted by Council. This resolution calls for plans and specifications.

Dayton, O.—County Commissioners Brenner, Eberly and Michael have passed resolutions providing for improvement of nine Montgomery county roadways under scarifying and paving process which is being worked out successfully in Toledo and Lucas county. Roads which will be scarified and repaired with tarvia, crushed stone, and gravel, are Eaton, Cincinnati, Centerville, Lebanon, Troy, Xenia, Covington and Germantown pikes and infirmity road. County commissioners will direct work on Troy, Xenia and Covington pikes.

Niles, O.—Ordinances have been adopted for improvement of various streets. Homer Thomas is clerk.

Salem, O.—E. M. French will commence survey of latter half of the Governor Cox Main Market Route No. 14. This survey will commence at Columbiana, and will end at Westville, distance of about 18 miles. It will require several weeks to complete.

Youngstown, O.—Cayahoga county will add sixty miles of rural brick road to its 400 miles of similar pavement, according to 1914 road improvement plans announced by County Engineer Stinchcomb. A minimum width of 16 feet has been adopted for roads to be laid during coming summer and entire expenditure, including fills, bridges, etc., will be somewhat in excess of \$900,000.

Johnstown, Pa.—Johnstown's \$100,000 issue of footfront paving bonds of 1914 have been sold to Newburger, Henderson & Loeb, of Philadelphia, at premium of \$2,323.

Johnstown, Pa.—Council is considering asphalt for new paving.

Williamsport, Pa.—Bids for paving of Louisa street from Hepburn to Center street and St. Boniface street from Wilson alley to Washington street, have been received by city engineer. Busch & Stewart and B. H. Coryell were two bidders.

Cumberland, R. I.—Sum of \$2,500 has been appropriated at annual town meeting for purpose of block paving with granite blocks portion of John street, Valley Falls, extending from the corner of Forest avenue, westerly to bridge which spans Blackstone river.

Knoxville, Tenn.—Gay St. will be paved with asphalt and brick.

Jackson, Tenn.—About 42,323 sq. yds. of bitulithic pavement is planned, to cost about \$1.60 per sq. yd., or total of \$78,916.80. Also about 69,194 sq. yds. of gravel pavement at estimated cost of 60c. per sq. yd., or total of \$41,516.40.

Austin, Tex.—Bonds in sum of \$150,000 for paving and street improvements have been approved.

Dallas, Tex.—County Engineer J. F. Witt is completing specifications and plans for paving of town square of Garland, in northern part of the county. County is to expend about \$4,000 in improving the county road through town and city government will spend like amount on pavement.

Fort Worth, Tex.—L. H. Blanke, Commissioner of Waterworks, and Assistant Purchasing Agent Miss May Williams have recommended to City Commission purchase of 32,000 to 128,000 barrels of oil from Texas Company at 75c per barrel. Commission will consider the matter.

San Antonio, Tex.—Council has appropriated \$15,000 for widening of North Alamo street, between Blum and Commerce streets.

Farmington, Utah.—State highway running through Davis Co., from Salt Lake to Ogden, will be resurfaced with concrete and a 5-mile road tax to provide funds for purpose will be levied.

Cheyenne, Wyo.—Commissioners of Laramie County and Albany County are discussing plans for improvement of Lincoln Highway throughout two counties.

CONTRACTS AWARDED.

Prescott, Ariz.—To A. A. Johns & J. T. Trenberth, of Aubrey Investment Co. of this city, contract for building wagon roads.

Sacramento, Cal.—Bids of construction of 36.9 miles of roadway in Shasta, Tehama, Butte and Glenn Counties have been opened by California Highway Commission. Following were smallest bidders: Shasta County, from La Moine to Hazel Creek Post Office, about 9.9 miles in length to be graded. Engineer's estimate, \$66,057.75; materials furnished by State, \$6,458; F. Rolandi, San Francisco, \$63,245. Tehama County, from the southerly boundary to Corning, about 8.8 miles in length, to be built of portland cement concrete. Engineer's estimate, \$59,459.88; materials to be furnished by State, \$28,173.04; M. Jacinto, Sacramento, \$53,679.40. Butte County, from Lindo Channel to the northerly boundary, about 11.2 miles in length, to be built of Portland cement concrete. Engineer's estimate, \$55,619.25; materials to be furnished by State, \$52,407.80; P. L. Burn, San Francisco, \$55,612.95. Glenn County, from Grapit to the northerly boundary, about 7 miles in length, to be built of Portland cement concrete. Engineer's estimate, \$39,884.25; materials furnished by State, \$22,225.84; P. H. Hoare, Oakland, \$37,209.50.

Chicago, Ill.—By Board of Local Improvements for construction of cement sidewalks on various streets to George Thomas; G. Kehl & Son Co.; Albert Graff; P. F. Biesen; Progressive Const. Co.; General Cement Const. Co.; A. P. Larsen; F. K. Shobe Paving Co., and Stewart-Callen Co. G. A. Schilling is President of Board.

Chicago, Ill.—By Board of Local Improvements for adjusting sewer manholes and catch-basins, constructing and connecting catch-basin inlets, constructing new brick catch-basins complete, constructing a granite concrete combined curb and gutter on cinders or sand, grading and paving with 6 ins. of portland cement concrete; 2 ins. of granite asphaltic concrete, composed of granite, sand, carbonate of lime and asphaltic cement, swept with natural hydraulic cement on various streets, to Barber Asphalt Paving Co.; Central Paving Co.; F. P. McCormick; American Asphalt Paving Co.; R. F. Conway Co.; John A. McGarry & Co., and Calumet Coal and Teaming Co. Geo. A. Schilling is President.

Hartford City, Ind.—For construction of Buckles road to C. F. Kegerries, of Hartford City, at \$9,698.70.

Indianapolis, Ind.—Board has awarded contract to Wm. F. Moore for paving Oliver avenue, from Harding to Division streets, at \$5.05 a lineal foot on each side of street, first grade asphalt to be used. The Union Asphalt Construction Company got contract for paving Oliver avenue, from Division street to Birch avenue, at \$3.93 a lineal foot. There are street car tracks in this section and street car company will be required to pave between its tracks. Contracts were awarded to Republic Construction Company for paving Clifton street from Twenty-seventh to Thirty-fourth streets, exclusive of space occupied by street car tracks, at \$2.53 a lineal foot and from Thirty-fourth to Thirty-sixth streets at \$3.57 a lineal foot. The American Construction Company received a contract for paving Clifton street from Roache avenue to Twenty-seventh street, at \$3.50 a lineal foot. All three sections are to be paved with "first grade" asphalt. The Union Asphalt Construction Company got contract for paving Ray street from River avenue to Division street with second grade asphalt, at \$2.90 a lineal foot.

LaPorte, Ind.—To George M. Gross, of LaPorte, contract by board of public works for putting down of concrete pavement in alley in rear of Rumely Hotel, that is between Maple and Jefferson Aves. and from Michigan to Indiana Aves. Gross's bid was \$1.49 per sq. yd. for pavement and 35c per lineal foot on cement curb. Only other bid, that of LaPorte Construction Co., was \$1.60 per sq. yd. on pavement and 35c for curb.

Leavenworth, Kan.—Bids have been opened for paving of 7th St. from Shawnee to Miami, and contracts to E. W. Geiger Construction Co. Mr. Geiger's bid was 35 cts. for grading and \$1.55½ for paving complete. James Stanton was only other bidder, his figures being 39 cts. for grading and \$1.57 for paving complete.

Topeka, Kan.—Contract for city sidewalk work has been awarded by board of commissioners. Every bid was below estimate of city engineer. Fred Luttjohann received contract. The 1914 side-

walks will cost Topeka \$6,392. City Engineer Young estimated that 68,000 square feet of cement sidewalk should cost the city 11½ cents per square foot, and that 1,800 square feet of brick walk should be laid for 10 cents per square foot. Mr. Luttjohann agreed to lay walks for .094.

Baltimore, Md.—By State Roads Commission two paving contracts—one calling for laying of a 14-ft. macadam way on Liberty Road, from Buck's Lane to Old Court Road, a distance of 4.35 miles, and other for laying of an asphalt pavement on Reisterstown Road, from the Pimlico circle to Baltimore county line, distance of 1.25 miles. First contract was given to Luck Construction Co., of Roanoke, Va., at a bid of \$56,046.20, the second going to local firm of P. Flanigan & Sons, at \$65,706.70. New Reisterstown Road will be 50 feet wide and will parallel Park Heights Ave., which is expected thus to be relieved of much traffic. Liberty Road contract, with others awarded for rebuilding of this thoroughfare from Brown's Hill to Eldersburg in Carroll Co., will mean total expenditure of over \$190,000.

Hagerstown, Md.—At meeting of State Roads Commission, held on May 29, contract was awarded to Burgess Brothers & Burgess, Scottville, Va., for resurfacing of section of State road, in Allegany county, from Green Ridge to Washington County Line, distance of 7.84 miles, construction to be of macadam.

Rockville, Md.—Contract for reconstructing road from Gaithersburg to Germantown, distance of more than four miles, has been awarded by state roads commission to Charles T. Eastburn Company of Yardley, Pa., price being \$53,719. Road will be of concrete.

Sault Ste Marie, Mich.—Several bids were opened by city council for contract of laying street pavements this year. Amount of contract will be in neighborhood of \$125,000 and was awarded to Cleveland Trinidad Paving Company, of Cleveland, O., at \$4.15 per square yard of granite block; \$3.18 for vitrified hillside pavements.

Virginia, Minn.—To Riberg & Marwick contract for several patches of paving and guttering, amounting in all to about \$16,000.

St. Joseph, Mo.—Board of Public Wks. has let two contracts for work, amounting to \$52,075.75. One contract let to Metropolitan Paving Co. will cost \$29,199.75. This is for paving of Twenty-eighth St. from Lafayette to Monterey Sts. with macadam, including 3,680 lineal feet of concrete curbing, 16,770 square feet of concrete sidewalks, 7,550 square yards of street paving; Warsaw Ave., from Mes-sanie to Olive Sts., with asphalt macadam, penetration method, including 1,790 lineal feet of concrete curbing; 8,650 square feet of sidewalks, 4,160 square yards of paving; Duncan St. from Twenty-ninth to Twenty-eighth Sts., with asphalt macadam, mixing method, including forty-five feet of concrete curbing, 230 feet of sidewalks, and 1,900 yards of paving; Twenty-eighth St. from Monterey to Duncan Sts., with asphalt macadam, mixing method, including 590 feet of concrete curbing, 2,655 feet of sidewalks, and 1,000 yards of paving. A \$22,876 contract was let to Standard Construction Co. for work on highway on Hansen Ave., Twenty-eighth and Plattsburg from Jackson to Krumm Sts. This will include 200 lineal feet of concrete gutters; 6,500 lineal feet of combination curb and gutter; 32,000 square feet of concrete sidewalks; 920 square feet of concrete driveways; 8,800 square yards of asphalt concrete.

Omaha, Neb.—Four miles of old pioneer trail through Macedonia and Grover townships, in eastern Pottawattamie Co., will be strengthened and graded at cost of \$6,250. Board of Supervisors accepted bid of Lana Construction Co. to do work for \$6,250, or 25c a cubic yard.

Morristown, N. J.—Contracts aggregating \$112,000 for road repair have been awarded at special meeting of Board of Freeholders. Director was authorized to appoint committee to take up matter of bond issue of between \$200,000 and \$300,000 for road work. Roads to be repaired, successful bidders and material to be used as follows: Blackwell St., Dover from Prospect St. to the Rockaway River bridge, to the Osborne Marsellis Co., amiesite, \$23,358.50; extra stone \$2.75 per ton. Main St., Boonton, from Washington to Church St., to the Osborne Marsellis Co., brick, \$3,607.50. Main st., Boonton, from Church St. to Pond Bridge, to the Osborne Marsellis Co., amiesite, \$9,877.63, extra stone \$2.65 per ton. Madison Ave., in Morris Township, from the fire box at a point opposite Evans to the

end of Warrenite work at or near the road leading to Convent Station; to Fred S. Smith, amiesite, \$17,424; extra stone \$2.65. Denville and Pine Brook Rd., in Hanover and Montville, from Parsippany at or near the Children's Home to the Essex Co. line; to Salmon Brothers, macadam, \$11,440. Mendham and Ralston Rd., from the flagpole in Mendham to the crossing of the N. J. & Pa. R. R. to Salmon Brothers, macadam, \$3,675, extra stone \$3.00 per ton. Morristown and New Vernon Rd. (James St.), to Osborne-Marsellis Co., amiesite, \$4,048, extra stone \$2.80 per ton. Green Village and Madison Rd., to Fred S. Smith, macadam, bid \$3,590.40, extra stone \$2.80. Morris St., Morristown, from the end of the Warrenite work at King St., to Washington Ave., to Osborne-Marsellis Co., amiesite, \$7,182, extra stone \$2.55 per ton. Newark and Pompton turnpike, Pompton River bridge to Mandeville Inn, to the Osborne-Marsellis Co., macadam, \$2,343.51, extra stone \$2.87. Cook Bridge, Afton and Madison Road., from the line dividing the Co. of Essex and Morris to the Madison Borough line, to the Osborne-Marsellis Co., material, macadam; bid \$11,088; extra stone, \$2.85 per ton. Lincoln Park and Mountain View Rd., from the Pompton River to the end of repairs at Towaco, to Salmon Brothers, macadam, bid \$2,407, extra stone \$2.50.

Perth Amboy, N. J.—For building of first section of Woodbridge-Roosevelt road to Conrad Seybolt, at about \$27,700.

Perth Amboy, N. J.—Contracts for paving Mechanic, Oak and Cortland streets have been awarded to Hastings Pavement Company, the only bidder. Hastings' bids were as follows: Mechanic street—Excavation, 68 cents a cubic yard; concrete, \$5.76 a cubic yard; old curb reset, 50 cents a lineal foot; new curb, 80 cents a lineal foot; asphalt block, \$1.50 a square yard. Oak street—Excavation, 68 cents a cubic yard; concrete, \$5.76 a cubic yard; old curb, 50 cents; new curb, 80 cents; asphalt block, \$1.50. Cortland street—Excavation, 68 cents; concrete, \$5.76; old curb, 50 cents; new curb, 80 cents; asphalt block, \$1.48.

Rochester, N. Y.—The contract for Castleman St. walks was awarded to J. Petrossi Co. for \$357.50. That for Atkinson St. asphalt pavement was awarded to the Rochester Vulcanite Co. for \$14,636. The J. Petrossi Co. will build the Greenfield St. sewer for \$2,307.

Schenectady, N. Y.—Four contracts have been awarded by Board of Contract and Supply. Proposals were opened from P. Camillo & Co., T. R. Crane and W. D. Goodale for laying of sidewalks, where not already laid, in various streets. Contract was given to P. Camillo & Co., firm being lowest bidder, rate being 9½ cents per sq. ft. for sidewalk and 12 cents per sq. ft. for concrete driveways. Total amount of the bid was \$1,069.

Utica, N. Y.—To Harry W. Roberts & Co. contract for grading and graveling Culver Ave. for parkway purposes at regular meeting of Board of Contract and Supply. Harry W. Roberts & Co. was only bidder, proposal being \$1,260. Park Board was authorized to contract with Harry W. Roberts & Co. for 1,750 gals. of extra binder at 22 cts. per gal., to be placed on easterly extension of parkway.

Watertown, N. Y.—Contract for paving of Coffee street has been awarded to Burns & McConville of Ogdensburg.

Columbus, O.—Bids were opened on June 16 for following roads, and contracts awarded: Lorain Co.—Oberlin-Elyria, M. & R., 75 miles asphalt macadam. Est. \$5,500.00; no bids. Lorain Co.—Oberlin-Norwalk, M. & R., .66 mile asphalt macadam. Est. \$4,600.00; no bids. Lorain Co.—Medina-Norwalk, M. & R., 1.89 mile asphalt macadam. Est. \$13,500; awarded to the Elyria Construction Co., Elyria, O., \$12,500. Erie Co.—Columbus-Sandusky, M. & R., 1.15 mile tar macadam. Est. \$5,400; awarded to Ed. F. Hoffman, Castalia, O., \$4,770. Greene Co.—Dayton-Chillicothe, 3.88 miles W. B. M. Est. \$34,789.05; awarded to the Wilson Engr. & Const. Co., Xenia, O., \$31,788. Lorain Co.—Ashland-Oberlin, 2.73 miles W. B. M. Est. \$24,184.50; awarded to Thos. Burton & Sons, Wellington, O., \$23,675. Muskingum Co.—Zanesville-Ostego No. 1, 1.32 mile brick. Est. \$17,773.72; no bids. Lorain Co.—Milan-Elyria, 4.27 miles W. B. M. Est. \$45,869.14; awarded to the Elyria Const. Co., Elyria, O., \$44,550. Champaign Co.—Urbana-West Jefferson, 1.0 mile, W. B. M. Est. \$8,789.72; awarded to John S. Sheedy, Urbana, O., \$8,481.72. Washington Co.—Hockingport-Powhatan "H", .75 mile concrete. Est. \$10,249.35; awarded to McGarry & Stowe, Akron, O., \$10,100. Wash-

ington Co.—Hockingport-Powhatan "G." 1.29 mile concrete. Est. \$16,410.35; awarded to McGarry & Stowe, 11-15 Balch St., Akron, O., \$15,990. Muskingum Co.—Zanesville-Cincinnati, 1 mile brick. Est. \$17,398.26; awarded to A. Emory & Sons, Zanesville, O., \$17,300. Champaign Co.—Piqua-Urbana, "H." 1.53 mile W. B. M. Est. \$14,800.38; awarded to Brewer, Tomlinson & Brewer, Chillicothe, O.; \$14,099. Champaign Co.—Urbana-Sidney No. 1, 1.0 mile W. B. M. Est. \$10,484.01; awarded to Brewer, Tomlinson & Brewer, Chillicothe, O.; \$10,084. Columbiana Co.—Salem-Hanoverton No. 1, 1.06 mile brick. Est. \$17,118.15; awarded to McLane & Hepburn, Lisbon, O.; \$15,893.85. Miami Co.—Piqua-Urbana "B." 5.88 miles W. B. M. Est. \$67,193.47; award withheld. Tuscarawas Co.—Ulrichsville-New Philadelphia, 1.50 mile brick. Est. \$31,623.20; awarded to The Wm. Brode Co., New Comerstown, O.; \$30,903.40. Tuscarawas Co.—Ulrichsville-New Comerstown No. 1, 1.66 mile brick. Est. \$26,911.62; awarded to the Wm. Brode Co., New Comerstown, O.; \$23,881.42. Wayne Co.—Wooster-Mansfield, 2.53 miles brick. Est. \$24,344.87; awarded to Wm. H. Dewell, Creston, O.; \$43,228. Wayne Co.—Orville-Northern, 1.50 mile brick. Est. \$28,108.80; awarded to H. D. Shannon, Orville, O.; \$26,900. Montgomery Co.—Dayton-Greenville, 2.34 miles brick. Est. \$43,250.98; award withheld. Athens Co.—Athens-McArthur, 2 miles brick. Est. \$40,305.41; awarded to Abner Juniper, Nelsonville, O.; \$38,869. Medina Co.—Medina-Wooster, .31 mile W. B. M. Est. \$2,724.67; awarded to Geo. S. Mellert, Medina, O.; \$2,724. Trumbull Co.—Youngstown-Cleveland, 2.70 miles brick. Est. \$69,319.70; awarded to Wm. M. Kusecker, Youngstown, O.; \$68,305.01. Summit Co.—Akron-Kent, 2.55 miles brick. Est. \$50,312.15; awarded to Eckrodt, Harbaugh & Payne, Akron, O.; \$47,400. Lorain Co.—Medina-Norwalk, 1.35 mile concrete. Est. \$24,803.58; awarded to The Elyria Const. Co., Elyria, O.; \$24,750. Muskingum Co.—Zanesville-Dresden, 1.55 mile concrete. Est. \$18,398.05; no bids. Coshocton Co.—Coshocton-Southern, 1.34 mile rick or concrete; award withheld. Medina Co.—Medina-Norwalk, .91 mile concrete. Est. \$9,882.70; awarded to Lee Griggs & Anderson, Millersburg, O.; \$9,880. Mahoning Co.—Youngstown-Salem, 1.13 mile W. B. M. Est. \$11,336.93; awarded to The Fleming, Hahn Platt Co., Youngstown, O.; \$11,300. Lake Co.—Cleveland-Buffalo, 2.46 miles brick. Est. \$69,313.70; awarded to E. A. Freshwater & Sons, Chester, W. Va.; \$69,295. Washington Co.—Marietta-McConnellsville, 2.23 miles concrete. Est. \$30,161.82; awarded to McGarry & Stowe, 11 Balch St., Akron, O.; \$29,490. Lorain Co.—Ashland-Oberlin, .95 mile slag macadam. Est. \$8,412.10; awarded to Thos. Burton & Sons, Wellington, O.; \$8,212. Lorain Co.—Bridge work on Ashland-Oberlin Rd. Est. \$24,728.30; award withheld. Perry Co.—New Lexington-Logan "H." 2.23 miles brick and macadam. Est. \$34,443.72; awarded to The Wilson Const. Co., Xenia, O.; \$34,099. Wyandot Co.—Upper Sandusky-Findlay, 2.74 miles W. B. M. Est. \$20,642.92; awarded to The National Lime & Stone Co., Carey, O.; \$20,625. Hardin Co.—Roundhead-McGuffey, 1.36 mile brick and concrete. Est. \$20,949.69; no bids. Lucas Co.—Monroe Turnpike, .03 mile concrete. Est. \$411.10; no bids. Perry Co.—Lancaster-New Lexington, 1.44 mile brick. Est. \$25,943.46; no bids. Perry Co.—McConnellsville-New Lexington, .50 mile W. B. M. Est. \$4,890.67; no bids. Perry Co.—Newark-New Lexington, 1.28 miles W. B. M. Est. \$14,503.80; no bids. Wyandot Co.—Uncapher, 1.74 mile macadam. Est. \$10,800.80; awarded to Barnes & Almendinger, Rocky Ridge, O.; \$10,799. Trumbull Co.—Youngstown-Conneaut No. 2, 2.51 miles concrete. Est. \$28,670.30; awarded to B. F. Hewett, Jefferson, O.; \$28,000. Tuscarawas Co.—Canal Dover-Wooster, 1.20 mile brick. Est. \$23,108.20; no bids. Trumbull Co.—Youngstown-Sharon No. 1, 3.19 miles brick. Est. \$70,222.30; no bids. Fayette Co.—Hillsboro-Washington C. H., 1.06 mile brick. Est. \$17,069.67; awarded to Graham & Kline, Columbus, O.; \$16,700. Knox Co.—Mt. Vernon-Coshocton No. 1, 1.10 mile brick. Est. \$23,240.80; no bids. Trumbull Co.—Youngstown-Cleveland, 2.33 miles brick. Est. \$58,172.97; awarded to Wm. M. Kusecker, Youngstown, O.; \$55,766.70. Wayne Co.—Wooster-Massillon, 2.56 miles brick. Est. \$53,208.80; awarded to The Midland Const. Co., Lima, O.; \$52,569.99. Harrison Co.—Bridgeport-Cadiz, 1.35 mile brick. Est. \$24,080.10; awarded to J. P. Warnick, Cadiz, O.; \$33,374. Erie Co.—Cleveland-Sandusky, 2.57 miles brick. Est. \$67,564.73. Also paving with concrete and constructing the bridges

and culverts. Est. \$53,024.28; award withheld. James R. Mackers, State Highway Comr.

Massillon, O.—The McGarry & Stowe Co., of Akron, has been awarded contract for paving of Wooster St. by Board of Control. Akron Co. bid \$22,509.80 for work, \$563.12 lower than other bidders. Paving will be laid upon concrete base and Massillon brick will be used with tar filler. Massillon brick was named instead of Metropolitan brick. Urban & Clements, only local bidders, asked \$23,072.92, and C. B. Her-ring & Son, of Mansfield, \$26,090.50. Work will be started June 15.

Niles, O.—At meeting of Board of Control following contracts for paving were awarded: Cedar St., Kennedy Bros., of Youngstown; Bessemer block, grout filler and Cleveland stone curbing. Beaver St., C. P. Flanagan; Tarvia, McAdam, Cleveland stone. Arlington and Church Sts., McDermott and Han-non; Dempster brick, concrete filler, Cleveland curbing. Chestnut St., Kennedy Bros. of Youngstown; Dempster brick, Ohio stone curbing, grout filler. Warren Ave., Kennedy Bros., of Youngstown; Bessemer block, Cleveland stone curbing and grout filler.

Baker, Ore.—Contract for Granite Rd. from Sumpter to Granite has been let by county commissioners to Anderson & McCarvell and calls for payment of \$2,175.

Franklin, Pa.—Contract for paving of Grant street has been awarded to Northwestern Construction Co., of Franklin. Their bid on different kinds of brick was as follows: Pennsylvania clay brick, \$27,528.35; Mack block, \$27,663.36; Bessemer, \$27,798.35. Other bids on paving, as figured up by city engineer, were as follows: Lawrence Schultz, Fredonia, N. Y., \$29,117.25. Burns Brothers, New Castle, \$28,882.25. Sutley and Long, Franklin, \$29,125.25. Franklin Engineering company, Franklin, \$29,297.72.

Harrisburg, Pa.—Contracts have been awarded June 16 by State Highway Commissioner Bigelow for 11 state-aid highways in different parts of state. Bids on one contract were held over for further consideration and investigation. Contracts awarded were as follows: In Chester county, East Bradford township, 17,103 ft. asphaltic bituminous macadam (penetration method) for 16,383 ft. and one course concrete roadway for 715 ft., to M. Bennett & Sons, Indiana, Pa., for \$52,612.78. The other bidders were: E. F. Richardson, Philadelphia, Pa., \$61,211.08; Corcoran Construction Co., West Chester, Pa., \$57,562.36; M. & J. Farrell, West Chester, Pa., \$72,230.01; Wm. C. Evans, Ambler, Pa., \$64,961.33; R. H. Johnson & Co., Wayne, Pa., \$54,866.70; Neff Horn & Co., Slatington, Pa., \$59,288.31. In Chester county, Kennett township, 15,272 ft. asphaltic bituminous macadam (penetration method), to D. E. O'Connell & Sons of Avondale, Pa., for \$53,984.43, subject to the approval of the local authorities. The bid of this firm was the lowest one on asphaltic bituminous macadam by penetration method and on Amiesite, and the Commissioner made the award subject to the township supervisors' approval. The other bidders were: George C. Souder, Lancaster, Pa., \$60,379.78; Ernest Palmer, Wallingford, Pa., \$70,790.54; E. F. Richardson, Philadelphia, Pa., \$53,787.67; Ambler Davis & Co., Philadelphia, Pa., \$56,600.05; Edward Bader, Philadelphia, Pa., \$66,362.52; Wm. C. Evans, Ambler, Pa., \$59,422.45; B. F. Wickersham, Kennett Square, Pa., \$56,632.35. In Montgomery county, Upper Dublin township, 3,107 ft. asphaltic concrete on a telford foundation, to Edward Bader, Philadelphia, Pa., for \$10,358.57. The other bidders were: D. Webster Anders, Philadelphia, Pa., \$15,359.30; B. F. Richardson, Philadelphia, Pa., \$10,180.18; Wm. C. Evans, Ambler, Pa., \$14,425.10. In Montgomery county, Abington and Cheltenham townships, 10,354 ft. of asphaltic bituminous macadam (penetration method). Commissioner Bigelow announced that the award would be held over for the present to permit of further investigation. The bids on this work were as follows: J. F. Shanley Co., Philadelphia, Pa., \$31,049.40; Chas. T. Eastburn Co., Yardley, Pa., \$38,357.81; Edw. Bader, Philadelphia, Pa., \$37,947.64; Manwaring & Cummins, Philadelphia, Pa., \$36,808.69; B. F. Richardson, Philadelphia, Pa., \$30,563.05; Sigafos & Poore, Riegelsville, Pa., \$32,798.06; Ambler Davis & Co., Philadelphia, Pa., \$30,964.15; D. Webster Anders, Philadelphia, Pa., \$34,081.65; D. Webster Anders, Philadelphia, Pa., (Amiesite), \$40,524.10; Neff Horn & Co., Slatington, Pa., \$37,137.80; S. Harper Dean, Fox Chase, Philadelphia, Pa., \$39,937.99; Wm. C. Evans, Ambler, Pa., \$40,-

087.16. In Fayette county, Fayette City Borough, 1,354 ft. brick block paving, contract was awarded to Hoblitzell & Price of Meyersdale, Pa., for \$6,952.42. The other bidders were: Ridge Bros. Co., Pittsburg, Pa., \$8,174.50; Thos. Arrigo, Charleroi, Pa., \$7,707.10. In Cambria county, East Taylor township and East Conemaugh Borough, a distance of 9,185 ft., for alternate bids of one course concrete roadway and brick block paving on a concrete foundation, the contract was awarded to Bell Bockel Co. of Altoona, Pa., at \$46,041.02 for brick. The other bidders on this contract were: Henry Bolar, McKeesport, Pa., \$50,770.30; \$58,388.70; Samuel Gamble & Co., Carnegie, Pa., \$51,420.12; \$58,591.02; Monongahela Const. Co., Pittsburg, Pa., \$47,043.63; \$49,144.88; John L. Elder, Ebensburg, Pa., \$46,751.50; \$52,663.20; Suppes Contracting Co., Johnstown, Pa., \$47,155.67; \$56,035.12; Baker-Owen Const. Co., Johnstown, Pa., \$60,319.05; \$62,737.65. In Cambria county, Barnesboro Borough, a distance of 6,242 ft. of brick block paving, the contract was awarded to Bell Bockel Co. of Altoona, Pa., for \$25,418.71. The other bids were as follows: Hoblitzell & Price, Meyersdale, Pa., \$27,432.49; John Dundree & Co., Patton, Pa., \$35,177.92; E. H. Brua, Hollidaysburg, Pa., \$29,256.05; Poli C. Azzarra, Barnesboro, Pa., \$26,634.31; Fogel & Co., Hollidaysburg, Pa., \$31,103.97; John L. Elder, Ebensburg, Pa., \$30,300.03. In York county, Stewartstown Borough, a distance of 5,270 ft. of asphaltic concrete on a concrete foundation, the contract was awarded to Dwyer & Co. of Philadelphia, Pa., the only bidders, at \$28,948.09. In York county, Hopewell township, a distance of 15,264 ft. of asphaltic bituminous macadam by penetration method, the contract was awarded to George C. Souder of Lancaster, Pa., at \$67,048.75. The only other was Dwyer & Co. of Philadelphia, Pa., at \$72,854.91. In Lycoming county, Montgomery Borough, a distance of 5,787 ft. of brick block paving, the contract was awarded to Busch & Stewart of Williamsport, Pa., at \$36,466.82. The other bidders were: W. H. Lyons, Sunbury, Pa., \$40,699.53; Monroe Paving Co., Langhorne, Pa., \$39,929.09; B. H. Coryell, Williamsport, Pa., \$36,767.19; G. W. Rockwell, Sunbury, Pa., \$42,016.52. In McKean county, Port Allegany Borough, a distance of 6,272 ft. of brick block paving, the contract was awarded to John Sheehan & Co., of Bradford, Pa., at \$36,929.05, the only other bidder being the Simpson & Mitchell Co. of Punxsutawney, Pa., at \$38,637.15. In Tioga county, Mansfield Borough, a distance of 7,464 ft. of brick block paving, the contract was awarded to Simpson Mitchell Co. of Punxsutawney, Pa., at \$48,398.20. The other bidders on this contract were as follows: G. W. Rockwell, Sunbury, Pa., \$51,677.86; G. W. Ensign, Inc., Harrisburg, Pa., \$65,187.50; Empire Contractors' Material & Equipment Co., Inc., Newark, N. Y., \$59,759.01; McNerney Const. Co., Canton, Pa., \$56,507.85. In Westmoreland county, Hempfield township, Route No. 118, a distance of 525 ft. of telford macadam, Commissioner threw out the bids of James H. Offutt of Greensburg, Pa., at \$3,712.77 and of Ridge Bros. Co. of Pittsburgh, Pa., at \$4,690.70, remarking that the State Highway Department could do the work cheaper.

Williamsport, Pa.—Commissioner James A. L. Minor, superintendent of public improvement, will recommend that Busch and Stewart be awarded contract to pave St. Boniface St., from Wilson alley to Washington St., and that E. H. Coryell be awarded contract to pave Louisa St. from Hepburn St. to Center. Committee has approved bid of Busch and Stewart for St. Boniface St. at \$2.16 a yard. Firm will use Clearfield brick, H. B. Coryell bid \$2.15 a yard for Louisa St. He will use Patton brick.

Nashville, Tenn.—Contract for laying sidewalks, curbs and gutters on several streets has been awarded to Adamant Stone & Roofing Co. at 22 cts. per ft. for curbs, 10 cts. for sidewalks and 20 cts. for gutters.

Hillsboro, Tex.—Road commissioners of Precinct No. 1 have awarded contract of building good roads in this precinct to Roach-Manigan Co., and W. Brodnax, a native Texan, will superintend the work. Roads are to be sixteen feet wide, eight feet permanent and apron of four feet on each side. The Roach-Manigan Company's bid, which was considered lowest, is as follows: Plain gravel \$4.27 per mile, plain gravel, asphalt bound, \$4.47; water-bound rock macadam \$4.73.50; rock macadam, asphalt bound, \$5.189. Road commission will later decide which materials they will select. This precinct

recently voted bond issue of \$250,000 and will expend this amount in good roads.

Ogden, Utah.—After considering matter for third time city commissioners have awarded contract for paving of 25th St. between Washington and Wall Aves. to G. A. Heman, Salt Lake contractor, at \$35,000. Heman was lowest bidder. The J. P. O'Neil Construction Co. was next lowest.

Salt Lake City, Utah.—By commission contract for resurfacing of Second South from Main to West Temple to P. J. Moran on bid of \$10,533.83.

Norfolk, Va.—Board of Control has awarded contracts as follows: United States Asphalt Refining Co., 30 tons of "Aztec" asphalt for the city engineer's department, \$16.99 per ton; J. Bolgiano & Son, Baltimore, 50 bushels of soja beans for Forest Lawn cemetery, \$2.50 per bushel; Burke & Gregory, printing for building department, \$4.25.

Seattle, Wash.—For paving East Howe St. to W. F. Meisner at \$5,450.45; for grading 44th Ave., S. W., and West Oregon St. to Sloane Bros. at \$7,222.60; for replanking First Ave., S., to Rollins Inv. Co. at \$19,019.49, and for paving East 72d St. to Krogh & Jessen at \$18,720.70.

Tacoma, Wash.—Largest paving contract of season has been let by Public Works Commissioner Woods to Joseph Warter, Sr., for \$26,750. Mr. Warter was just \$214 below bid of Washington Pav-

Milltown, N. J.—Following are bids received June 15 for sewerage works: (a) Schneider & Stelle, New Brunswick, N. J.; (b) Moran & Sebolt, New Brunswick, N. J.; (c) Frank Puglia, Paterson, N. J.; (d) Connecticut Eng. & Cont. Co., Norwich, Conn.; (e) J. W. Heller, Newark, N. J.; (f) Fillebrown-Taylor Co., New York; (g) Atlantic Con. & Supply Co., Atlantic City, N. J.; (h) Kelley-McFeeley & Co., Camden, N. J.; (i) Sutton & Corson Co., Ocean City, N. J.; (j) John J. Hart, Peekskill, N. Y.; (k) Joseph Johnson & Sons, New York:

Items.	Quantity.	(a) Unit price.	(b) Unit price.	(c) Unit price.	(d) Unit price.	(e) Unit price.
8" V. S. P. 0-6.....	14,500'	\$0.49	\$0.37	\$0.43	\$0.60	\$0.45
8" V. S. P. 6-8.....	10,855'	.54	.49	.49	.70	.55
8" V. S. P. 8-10.....	1,580'	.59	.77	.75	1.00	.75
8" V. S. P. 10-12.....	500'	.90	.97	1.75	1.40	1.25
8" V. S. P. 12-14.....	200'	1.32	1.27	2.25	1.60	2.25
8" V. S. P. 14-.....	100'	2.42	1.67	2.50	1.90	3.50
10" V. S. P. 0-6.....	6,390'	.56½	.46	.50	.70	.55
10" V. S. P. 6-8.....	225'	.63	.61	.65	.85	.75
10" V. S. P. 8-10.....	.....	.70	.97	.80	1.00	1.10
12" V. S. P. 0-6.....	2,450'	.66½	.60	.60	.80	.65
12" V. S. P. 6-8.....	3,300'	.73	.77	.75	.95	.90
12" V. S. P. 8-10.....	2,431'	.85	.80	.80	.85	1.00
15" V. S. P. 0-6.....	.....	.94	1.10	1.10	1.05	1.25
15" V. S. P. 6-8.....	.....	1.06	1.65	1.50	1.25	1.60
15" V. S. P. 8-10.....	100'	.25	.30	.50	1.05	.30
5" deep house con.....	.....	.30	.45	.25	.15	.25
5" tile underdrain.....	.....	.....	.....	.....	.....	.....
Foundation lumber.....	2,000 M	48.00	75.00	50.00	50.00	40.00
Sheathing.....	5,000 M	35.00	75.00	40.00	50.00	35.00
Cast iron pipe.....	18 tons	47.00	50.00	40.00	42.00	50.00
Concrete Class "A".....	10 yds.	12.00	10.00	7.00	7.50	8.00
Concrete Class "B".....	10 yds.	15.80	12.00	8.00	12.50	7.00
Embankment.....	20 yds.	.75	.65	1.00	.95	1.00
Manholes.....	136	35.70	35.00	30.00	33.00	35.00
Manholes, extra depth.....	15	5.00	5.00	5.00	4.00	3.00
8" c-i. syphon.....	1,620'	.84	.88	1.00	1.25	1.10
6" c-i. syphon.....	1,620'	.65½	.72	.80	1.10	1.00
Pump station.....	1	11,200.00	12,543.25	12,200.00	7,812.00	12,000.00
12" c-i. force main.....	9,100'	1.37	1.52	1.75	1.32	1.60
14" c-i. force main.....	.....	1.64	1.87	3.50	1.65	2.00
Totals.....	.....	\$57,175.00	\$57,336.65	\$59,989.60	\$60,535.10	\$61,913.00

Items.	(f) Unit price.	(g) Unit price.	(h) Unit price.	(i) Unit price.	(j) Unit price.	(k) Unit price.
8" V. S. P. 0-6.....	\$0.58	\$0.53	\$0.59	\$0.64	\$0.55	\$0.70
8" V. S. P. 6-8.....	.66	.57	.67	.78	.69	.95
8" V. S. P. 8-10.....	.72	.66	.82	1.37	.88	1.40
8" V. S. P. 10-12.....	1.00	.81	1.12	1.70	1.12	1.70
8" V. S. P. 12-14.....	1.50	1.00	1.38	2.00	1.93	3.00
8" V. S. P. 14-.....	2.20	2.00	2.02	2.27	2.50	3.00
10" V. S. P. 0-6.....	.65½	.64	.72	.72	.73	1.00
10" V. S. P. 6-8.....	.77½	.67	.80	.86	.92	1.10
10" V. S. P. 8-10.....	1.50	.85	.98	1.45	1.10	1.50
12" V. S. P. 0-6.....	.85	.70	.85	.80	.80	1.20
12" V. S. P. 6-8.....	.92	.85	.96	.95	1.00	1.40
12" V. S. P. 8-10.....	.94	.90	1.04	1.05	.98	1.60
15" V. S. P. 0-6.....	1.50	.95	1.15	1.20	1.20	2.00
15" V. S. P. 6-8.....	1.95	1.10	1.50	1.79	1.49	3.00
15" V. S. P. 8-10.....	1.00	.25	.40	.30	.25	1.00
5" deep house con.....	.32	.30	.30	.25	.25	.50
5" tile underdrain.....	.....	.....	.....	.....	.....	.....
Foundation lumber.....	52.00	60.00	55.00	60.00	45.00	40.00
Sheathing.....	45.00	35.00	50.00	32.40	30.00	38.00
Cast iron pipe.....	50.00	40.00	45.00	31.20	36.00	50.00
Concrete Class "A".....	6.75	8.00	10.00	6.35	8.00	7.00
Concrete Class "B".....	8.00	12.00	15.00	10.80	10.00	15.00
Embankment.....	.69	.75	1.00	.40	.50	.55
Manholes.....	37.50	39.00	39.00	59.55	40.00	60.00
Manholes, extra depth.....	5.50	4.00	7.00	6.00	4.00	5.00
8" c-i. syphon.....	1.16	.70	1.46	.92	2.15	2.00
6" c-i. syphon.....	1.07	.58	1.24	.72	2.00	1.80
Pump station.....	9,534.25	14,000.00	14,038.00	12,270.00	12,300.00	12,000.00
12" c-i. force main.....	1.47	1.60	1.65	1.64	1.86	3.00
14" c-i. force main.....	1.75	1.90	2.03	1.96	2.16	4.00
Total.....	\$62,703.62	\$63,931.60	\$71,048.79	\$72,935.85	\$73,128.43	\$97,717.30

Clyde Potts, Civil and Sanitary Engineer, 30 Church St., New York.

ing Co. City engineer's estimate of work was \$36,911. Work will be done on South 23d St. from J to Wilkeson Sts.

Niagara Falls, Ont., Can.—Stanley Construction Co. has been awarded contract to construct 34 miles of macadam highway through the county this year, at \$48,050 per mile. County Council accepted this bid from twelve others. Crushed stone is to be supplied by Standard Crushed Stone Co., another Niagara Falls concern. Government will pay one-third of cost of work.

SEWERAGE

Stockton, Cal.—Resolutions have been adopted for construction of sewers in various streets. C. C. Terry is Supt. of streets.

Wilmington, Del.—Bids will be received until 8 p. m., July 13, for \$50,000 sewer and water bonds. C. R. Hughes is Town Treasurer.

Perry, Ia.—Dallas County Drainage Ditch No. 30 will be let on or about July 7th, at Adel, Iowa, same being combination storm sewer and County Drain for City of Perry. Estimated price about \$10,000. Chas E. Wilson, is engineer in charge.

Baltimore, Md.—Complete sewerage plants for Arlington and Tiffany runs districts of Baltimore Co. have been discussed by Baltimore County Commissioners in conference with Dr. John Fulton, secretary of State Department of Health.

Foxboro, Mass.—Sum of \$13,000 has been appropriated for building sewers and for extending filter beds.

Malden, Mass.—Bids for construction of sewers to cost about \$10,000 will be received shortly.

Kalamazoo, Mich.—See "Streets and Roads."

Havre, Mont.—Bids have been advertised for construction of about 5 miles of sewers, and filtration disposal plant.

Elizabeth, N. J.—Engineer has been directed to prepare specifications for

sewer in DeWitt St., and Clerk to advertise for bids for the work. Bids will be opened June 30.

Perth Amboy, N. J.—Construction of 15-in. sewer in Meredith street is being considered.

Trenton, N. J.—Ordinance has been adopted for construction of various sewers. Frank Thompson is City Clerk.

Brooklyn, N. Y.—Metropolitan Sewerage Commission has submitted report of sewage disposal to Mayor Mitchel.

Lyons, N. Y.—Taxpayers of this village by vote of 228 to 43, have voted in favor of installing sewer system and sewage disposal plant costing \$135,000.

Oswego, N. Y.—Following are seven bids received on sanitary sewer in West Eighth street, from Seneca to Schuyler street. Angelo Falvo was only bidder, submitting proposal to do work for \$430.20. Falvo was only bidder also, \$8,659.38, on following sewers: Murray, Tallman to Gerrit; Ellen, Murray to west of West Seventh; Third, Ellen to Gerrit. Luciano Tremeti bid \$1,371.30 for West Oneida street, Singleton to Lathrop; and Liberty bridge to Turritt street. For Fifth avenue, Seneca to Bridge; Seventh avenue, Bridge street south, L. Tremeti bid \$2,587.05, and Hackett & Scott of Fulton, \$3,402.19. For West Third, Ohio to Tallman, and Ohio, Second to Third, James Fennell bid \$1,524.24; Hackett & Scott, \$1,999.29; and L. Tremeti, \$1,526.96. For West Seventh, Albany to Niagara; West Eighth street, Utica to Niagara; Hackett & Scott, Fulton, bid \$2,717.55; L. Tremeti, \$2,550.33; James Fennell, \$2,406.55; Angelo Falvo, \$2,470.05. Above sewers are first to be built under recent \$110,000 bond issue.

Oswego, N. Y.—Commissioner of Works Linsley has opened bids on half a dozen lateral sewers, first to be constructed under recent bond issue of \$110,000. There were four bidders, Hackett & Scott of Fulton, Angelo Falvo, Luciano Tremeti and James

Fennell. Bids have not yet been extended. Falvo was only bidder on Ellen St. sewer.

Tarboro, N. C.—People will shortly vote on \$25,000 bond issue for extension of sewerage system.

Erie, Pa.—Bonds in sum of \$47,000 for construction and reconstruction of storm sewers and conduits will be sold at 10 a. m., June 29. T. Hanlon is City Clerk.

Watertown, S. D.—Election may shortly be held for voting on bond issue for sewer system extension.

Beaumont, Tex.—Commissioners' Court have entered formal order for election in drainage district No. 5, to determine whether \$175,000 worth of bonds shall be issued for purpose of constructing drainage ditches. Date fixed for election is Thursday, July 2.

Ennis, Tex.—City of Ennis has secured option on sewer system owned by Ennis Sewer Co., good until Oct. 1, to be taken over by city at price of \$23,000. Upon result of bond issue election to be held June 23 will depend whether city can take advantage of its option.

Salt Lake City, Utah.—Concrete pipe will probably be used in proposed million dollar sewer extension which city proposes to construct in near future. Bids on their respective classes of sewer pipe, of which approximately \$100,000 worth will be used in extension, were received by city commission from Utah Concrete Pipe Co. and Utah Fire Clay Co., both Salt Lake City concerns. Bid on concrete pipe was more than \$12,500 less than that on fire clay pipe.

Salt Lake City, Utah.—Sewer and water bonds in sum of \$300,000 have been sold.

Milwaukee, Wis.—Chief Engineer Hatton of sewerage commission has submitted to health department plan for sewage disposal system at Blue Mound sanitarium which includes Imhoff settling tank and may be constructed at cost of from \$3,000 to \$5,000.

CONTRACTS AWARDED.

Belleville, Ill.—For constructing sewers as follows: Sec. 1 to Reeb Bros., Belleville, Ill., at following bid: 1,900 lin. ft. V. C. pipe, 24-in., \$1.92; 2,600 lin. ft. 30-in., \$3.08; 3,000 lin. ft. 36-in., \$4.05; 1,000 lin. ft. 42-in., \$4.80; 36 lin. ft. c. i., 24-in., \$5.25; 27 brick manholes, \$43; total, \$29,956. Sec. 2 to Contractor Nelson, Racine, Wis., at following bid: 10,000 lin. ft. V. C. pipe, 6-in., 45 cts.; 2,460 lin. ft. 12-in., \$1.05; 3,640 lin. ft. 18-in., \$1.45; 4,570 lin. ft. 24-in., \$2.55; 5,465 lin. ft. 30-in., \$2.95; 2,873 lin. ft. 36-in., \$4; 24 lin. ft. c. i. pipe, \$7; 57 brick manholes, \$48; total, \$54,532. Sec. 3 to Reeb Bros., Belleville, at following bid: 6,200 lin. ft. V. C. pipe, 6-in., 55 cts.; 4,740 lin. ft. 12-in., 95 cts.; 6,065 lin. ft. 18-in., \$1.40; 4,309 lin. ft. 24-in., \$2.23; 900 lin. ft. 30-in., \$2.70; 48 lin. ft. c. i. 24-in., \$6; 46 brick manholes, each, \$44; septic tank, \$3,200; total, \$33,955. W. C. Wolf is City Engr.

Chicago, Ill.—By Board of Local Improvements, for tile pipe sewers with brick manholes and brick catch basins in various streets, to Achilles Scully, Garrett Barry, George Ponorelli, Ryan Co., Simon Ryan, Thomas Burke, Tiritilli & Till, Carmine Roberts and P. J. McNulty Co. Also for drains in various streets as follows: Simon Ryan, J. J. Lynch, Louis Scully and Mike Di Vito. G. A. Schilling is President of Board.

Hammond, Ind.—To United Construction Co. at \$689,795, for construction of deep sewer system. Other bidders were: Proudfoot Co., \$716,908; Nash, Dowdle Co., \$726,872; and Thomas Lavene, \$782,633.

Perry, Ia.—Following are bids received for Perry West Side sewer system: (a) La Gue & Kruse, Spencer, Ia. (b) Western Constr. Co., Iowa City, Ia. (c) Black Hawk Constr. Co., W'loo, Ia. (d) Intermountain Br. & con. Co., Tecumseh, Neb. (e) Greggs & Cary, Shenandoah, Ia. (f) Katz Constr. Co., Omaha, Neb. (g) W. G. Birdsall, Perry, Ia. (h) Dearborn Con. Co., Waterloo, Ia. (i) Wm. Fitch Co., Omaha, Neb. (j) Alamo Engine & Sup. Co., Omaha, Neb. (k) Wm. Houser, Chicago, 1,964 ft. of 15-in. (a) \$1.13; (b) \$1.10; (c) \$1.10; (d) .90; (e) \$1.11; (f) .86; (g) .94; (h) \$1.08; (i) .88; (j) \$1.05; (k) \$1.69. 1,058 ft. of 12-in. (a) .81; (b) .80; (c) .88; (d) .80; (e) .85; (f) .76; (g) .79; (h) .95; (i) .74; (j) .77; (k) \$1.35. 1,914 ft. of 10-in. (a) .69; (b) .75; (c) .75; (d) .70; (e) .75; (f) .71; (g) .72; (h) .75; (i) .66; (j) .66; (k) \$1.16. 9,474 ft. of 8-in. (a) .59; (b) .63; (c) .55; (d) .55; (e) .62; (f) .56; (g) .59; (h) .60; (i) .58; (j) .55; (k) .99. Contract was awarded to Katz Const. Co., Omaha, Neb., at total of \$10,533. C. E. Wilson is Civil Engr., Perry, Ia.

Nickerson, Kan.—By City Council of Nickerson contracts for construction of new municipal waterworks plant and sewer system in that city, as follows: J. H. Shears & Son, Hutchinson, contract for sewer work, including laterals, \$5,926.70; Squire Electric & Construction Co., water works, mains and power house, \$5,394.30; United States Cast Iron Pipe Co., cast iron water mains, \$10,509.21; Des Moines Bridge & Iron Co., constructing water tank and tower, \$3,590; Worthington Pump Co., pump and motors, \$1,715; Ludlow Valve Co., valves and hydrants, \$1,199.85. This makes total cost of the waterworks contracts let yesterday, \$22,408.26, which with cost of sinking wells, and engineering will make plant cost \$26,000.

Portland, Me.—Contract for construction of section of North Side intercepting sewer, between Preble St. and Forest Ave., 1,180 ft., has been awarded to Raffaele Leo & Co., the lowest bidder, whose figures were \$6,741.95. Other bids received in office of department of public works were: James Ferguson, \$7,895.65; Profenno & Lorello, \$7,320.99; John W. Gulliver, \$8,220.65; Forgiione & Romano, \$7,670.75; Mahoney Construction Co., \$9,292.20.

Lakefield, Minn.—To H. J. Cathroe & Co., of Omaha, Neb., at \$29,700, for construction of four miles of sewers and settling tank and sludge beds.

Virginia, Minn.—To Thornton Bros., of St. Paul, Minn., at \$65,687, for construction of sewers.

Virginia, Minn.—City has in contemplation most extensive sewer work ever planned at once. Five bids were received for this sewer work, two of which are from Duluth: Thornton Bros., St. Paul, \$65,687; Pastoret-Lawrence, Duluth, \$66,610; W. S. King Construction Co., Duluth, \$74,069; Butler Construction Co., Virginia, \$75,065; Lawrence McCann, Virginia, \$66,072. The St. Paul concern being lowest bidder is expected to get contract.

Virginia, Minn.—City Council has awarded big sewer contract to Lawrence McCann Construction Co. of this city for \$66,072.56, theirs being lowest of six bids. This contract calls for sewer extensions, enlargements and some new sewers to give city adequate sewer system, especially storm sewers.

Milltown, N. J.—Contract for sewer work has been awarded to Schneider & Stelle, New Brunswick, N. J.

Milltown, N. J.—For construction of sewerage works for which bids were opened June 15; lowest bidder was Schneider & Stelle, New Brunswick, N. J., at total bid of \$57,175. Clyde Potts, of New York, is Engineer.

Binghamton, N. Y.—To George Serfina of Binghamton contract to build sewer on Dwight St. at cost of \$496.18 and George Pignatello to build London St. sewer for \$750.75.

Buffalo, N. Y.—Bids have been opened by department for building proposed Hertel Ave. sewer. Low bidder was Joseph F. Stabell Co., of Buffalo, at \$93,983. This sewer will be a 9½-foot sewer from overflow east of Tonawanda St. to point some distance north of Arthur St. It will care for Black Rock drainage.

Salt Lake City, Utah.—Pipe for new sewer southeast and south of city will cost not more than \$83,037.83, according to agreement entered into by city commission and representatives of Utah Cement Pipe Co. and Utah Fire Clay Co. Under agreement concrete company will furnish one-half of pipe at cost of not to exceed \$41,860.06 and fire clay company will furnish other half at cost not in excess of \$41,077.17. Bids for construction of 67 miles of sewer will be advertised for within few days.

WATER SUPPLY

Collinsville, Ala.—Town has voted \$16,000 bond issue for waterworks and sewerage system. Water system bonds carried, but sewerage bonds lost.

Denver, Colo.—Public Utilities Commission, by resolution has directed that entire \$8,000,000 issue of bonds for construction of municipal water system be advertised at once so that work of building new system may be started.

Wilmington, Del.—Bids will be received up to 8 p. m., July 13, for \$50,000 water and sewer bonds. C. R. Hughes is Town Treasurer. H. W. Hatton is Cons. Engr.

St. Augustine, Fla.—City Council last night authorized the appointment of a committee to confer with the board of bond trustees relative to the installation of a water softening plant.

Columbus, Ga.—The \$450,000 bonds for purpose of building and maintaining a municipal water works plant for Columbus which were voted for in recent election, have been sold to Kean & Taylor Co., of New York.

Bloomington, Ind.—City Council has closed contract for about 35 acres of land surrounding Leonard Springs, and that work of constructing dam at new source of water supply and laying of large pipe line to plant in city is to be done immediately.

Murray, Ky.—Installation of water plant is being considered.

Baltimore, Md.—In connection with improvements by Water Department at Lake Montebello proposals were opened before Board of Awards for eight buildings as part of filtration plant. Cost of these buildings will aggregate \$200,000. Firms that bid on work are Consolidated Engineering Co., Henry Smith, Morrow Bros., and D. M. Andrew Co. The Consolidated Engineering Co. seems to be lowest bidder, but proposals were referred to Water Department for tabulation and report.

Aurora, Minn.—Thirty-five thousand dollars in bonds have been authorized by voters at special election for water and light purposes. There were two propositions submitted, one for \$15,000, making extensions and improvements in present water system, and other for \$20,000 for enlarging present light plant. Both propositions carried. Present water supply is inadequate. Village contemplates drilling wells for an increased supply.

Butler, Mo.—Election to vote \$75,000 in bonds to build or acquire water works plant has been carried.

Hastings, Neb.—Council has authorized purchase of centrifugal pump for water plant.

Millville, N. J.—To meet growing demands of Millville for water, Millville Water Co. has planned improvements to its plant which will amount almost to renewal of works.

Perth Amboy, N. J.—Ordinance has been adopted providing for issue of water bonds in sum of \$100,000. C. D. Snedeker is president of Board of Water Comrs.

Lestershire, N. Y.—Special meeting of Board of Water Commissioners will be held this evening, when Consulting Engineer Firestone's plans for improving waterworks will be considered. Bonding election to provide appropriation of \$15,000 for installation of new Corliss engine and minor additions will be discussed. If installation of another engine is decided upon, addition to pumping room of present waterworks building will be necessary.

Theresa, N. Y.—Water commissioners of this village have posted notices calling for bids to extend water mains 1,092 feet on Brooklyn side. Trench is to be five and one-half feet deep and two and one-half feet wide at top and one and one-half feet wide at bottom. Proposed extension is to supply water to people within corporation and furnish fire protection to those living in that vicinity. Notices call for sealed bids. President of water board is Dr. Byron Haskin.

Scotland Neck, N. C.—Plans are being made for installation of water works.

Sandusky, O.—Ordinance authorizing issuance of bonds to cover cost of work of installing intake pipe in connection with waterworks plant has been passed by city dads. Bonds will be issued to amount of \$45,000 and contract for job will be let in near future.

Ashland, Ore.—Election on bond issue for water works has been carried.

Pittsburg, Pa.—Bond issue of \$20,000 has been authorized by Borough of Springdale by vote of 127 to 33. Money will be expended in completion of storage reservoir in Springdale township and addition of filter.

Maryville, Tenn.—Maryville has arranged for construction of water system out of bond issue of \$80,000. R. C. Huston & Co. of Memphis are engineers.

Dallas, Tex.—City Commissioners have taken steps to place 2,500 more patrons of Dallas water department under meter system by naming Commissioners Nelms and Blaylock as members of committee to negotiate for purchase of that number of meters. An appropriation of \$25,000 was provided for meter installation in current waterworks budget.

Groesbeck, Tex.—Groesbeck citizens by majority of more than three to one voted bond issue of \$10,000 for improvement of waterworks system of the city.

Milford, Tex.—In city election \$14,000 bond issue carried by majority of twelve to one. This money will be used to install up-to-date waterworks system. City Council will proceed at once toward

making necessary arrangements for issuance of these bonds, and hope to have waterworks in operation at earliest possible date.

Sweetwater, Tex.—Mayor George D. Wilson, of Sweetwater, has obtained approval of attorney general's department on issue of \$320,000 City of Sweetwater bonds to be expended in building and equipping complete system of waterworks.

Salt Lake City, Utah.—Water and sewer bonds in sum of \$300,000 have been sold.

Prince Rupert, B. C.—Laying of about 8 miles of steel water pipe, 6 to 12-in. diam., to cost \$140,000, is being considered. P. M. G. Mason is City Engr.

CONTRACTS AWARDED.

Nickerson, Kan.—See "Contracts Awarded" of "Sewerage."

Washington, Kan.—To E. W. Middleton of Kansas City, Mo., at \$10,105, for general contract for installation of 50,000-gallon water purification plant. Ludlow Valve Co. will furnish valves, etc. The U. S. Cast Iron Pipe Co. has contract for cast iron pipe at \$3,655. American Well Works, Aurora, Ill., will install pumps and motors for \$3,792, and New York Continental Jewel Filtration Co., New York City, will install the equipment for \$6,700. Worley & Black, Kansas City, Mo., are Engineers.

Milltown, N. J.—Contract for water works has been awarded to Suburban Engineering Co., 15 W. 38th street, New York City.

Milltown, N. J.—For construction of water works for which bids were opened June 15, lowest bidder was Suburban Engineering Co., of New York City, at \$34,623.57. Clyde Potts, of New York, is Engineer.

St. Johnsville, N. Y.—Bids were received at St. Johnsville June 15 for concrete reservoir as follows: R. F. Rely

Co., Saranac Lake, \$11,880; Suburban Engineering Co., New York City, \$14,835; Oliver Hurst & Co., Tribes Hill, \$14,920; W. L. Bellinger, St. Johnsville, \$15,400; John E. Pidgeon, Troy, \$16,385; Nixdorf & DeSenna, Oneida, \$17,258; W. A. Lafter, Rochester, \$17,350. R. F. Rely Co. was awarded contract. F. E. Crane, Engineer.

Eugene, Ore.—Eugene water board has awarded contract for laying approximate total of 21,600 feet in extensions to water system to James Kennedy & Co., of Spokane. Figure submitted by company offering successful bid was \$4,320. Contract for furnishing pipe was let to Crane & Co., of Portland. The pipe is to be of steel material. Of total of 21,600 feet of extension contracted for recently there will be 2,200 feet of 12-inch mains, 6,800 feet of 10-inch mains, 12,200 feet of 8-inch mains, and in the neighborhood of 400 feet of 6-inch mains.

Lafayette, Ore.—By Town Council to Morgan-Boyatt Co., Portland, for constructing water works, at \$15,000.

Harrisburg, Pa.—When bids for 4,500 feet of water pipe for seven street sections were opened by Harry F. Bowman, commissioner of public safety, the Johnson Construction Co. of this city were low bidders. The bids follow: Johnson, 12-inch pipe, 35 cents; M. E. Saul, 37 cents; Johnson Co., 6-inch pipe, 22 cents; Saul, 23½ cents. Council will be asked to confirm award of contract.

Nashville, Tenn.—Under contracts awarded by Board of City Commissioners, on recommendation of Commissioner Robert Elliott, for repair and treatment of interior of west basin of city reservoir in accordance with plans approved by Rudolph Hering of New York, total cost of work will be about \$23,000. To C. B. Wilson & Co. was awarded contract for constructing concrete floor slabs, 16 ft. square and 4 ins. thick, joined up directly to walls of basin, with concrete filler in joints, at \$9,720; also for furnishing and placing so much Portland cement mortar as may be needed for leveling up depressions in old concrete floor, at rate of \$8.50 per cubic yard; and also for cleaning and preparing walls of interior of basin and sand blasting and plastering them and guaranteeing a perfectly waterproof job, and for plastering and exposed surfaces of brick work of new storeroom at gate house and of main stairway, at \$10,750. To H. W. Johns-Manville Co. was awarded contract for coating floor of basin with liquid asphalt at \$1,965.

Salt Lake City, Utah.—Contract for construction of Thirteenth South supply

main for enlargement of water supply in southeast and southern parts of city has been awarded to Lyman & Samuels. Bid was \$92,396.59, being lowest of nine bids submitted. Estimate of city engineer for improvement was \$100,000. City Commission decided to use cast iron pipe for supply main, which will add about \$10,000 to the cost.

Toronto, Ont.—To John Ver Mehr Co., Toronto, at \$1,066,282, for duplicate filtration plant on Island.

LIGHTING AND POWER

Reynolds, Ga.—City Council is considering installation of municipal electric light plant. Plans provide gasoline engine and 100 lamps of 100 c.p. for street lighting system. G. L. Cooper is secretary and treasurer.

Indianapolis, Ind.—B. J. T. Jeup, City Engineer, expects to begin work at once, working out system of street lighting between city and Merchants' Heat & Light Co. Contract is to be effective April 1, 1915, and is for ten years.

Kanopolis, Kan.—City is extending electric light system two blocks south on alley east of Journal office, thence one block east, then south two blocks.

Leavenworth, Kan.—A franchise giving W. J. Squires right to manufacture electricity in Leavenworth for next 20 years is being considered. As to "white way," company offers to furnish power for standards bearing five globes, four of 48-watt power and one of 80, for \$32 a year per standard.

Murray, Ky.—Installation of light plant is being considered.

Bozette City, Mich.—Installation of new lighting system to replace arc lamps now in use is being considered. Plans for the erection of 50 4-amp luminous lamps, at cost of \$3,500.

Grand Rapids, Mich.—City engineer has submitted estimate of cost of installing ornamental lighting system on West Leonard street, at \$8,000.

Aurora, Minn.—Bonds in sum of \$20,000 have been voted for enlarging present light plant.

Livingston, Mont.—Resolution has been adopted providing for creation or improvement district for ornamental tungsten lights to include not only business district but much of residence district. It is proposed to use five-light cluster system in business district, four on each side of street, and single lights, four to block in residence section.

Bids for Water Works for Milltown, N. J., opened June 15, 1914.

Items.	(a) Quantity.	(b) Unit price.	(c) Unit price.	(d) Unit price.	(e) Unit price.	(f) Unit price.
C-i. pipe per ton.....	520	\$20.25	\$22.83	\$24.00	\$21.94	\$22.50
C-i. specials.....	10	55.00	55.00	70.00	55.00	50.00
4" c-i. pipe laid.....	1,900	.18¾	.29	.28	.27	.42
6" c-i. pipe laid.....	14,160	.20	.33	.33	.30	.43½
8" c-i. pipe laid.....	1,510	.23½	.36	.36	.33	.46½
10" c-i. pipe laid.....	7,090	.283	.38	.50	.36	.57½
4" valves.....	3	11.00	9.00	12.00	12.00	14.00
6" valves.....	21	16.00	14.46	16.80	16.00	18.50
8" valves.....	1	23.00	21.00	23.00	21.50	25.00
10" valves.....	7	34.00	30.54	32.00	30.50	32.00
Hydrants.....	40	35.00	28.70	26.00	27.00	25.00
Wells.....	3	840.00	510.00	600.00	1075.00	950.00
Wells, extra depth.....	....	24.00	30.00	15.00	5.00	50.00
Stand pipe.....	1	5800.00	5058.40	5000.00	5500.00	5159.00
Pump station.....	1	2240.00	1686.00	2640.00	5120.00	2070.00
Pump gas engine.....	1	2930.00	2784.00	2600.00	2655.00	2033.00
Pump motor.....	1	2480.00	2124.00	2600.00	2504.00	3000.00
Totals.....	....	\$34,623.57	\$35,809.04	\$38,804.20	\$40,466.50	\$40,603.50
						\$41,120.50

Items.	(g) Unit price.	(h) Unit price.	(i) Unit price.	(j) Unit price.	(k) Unit price.	(l) Unit price.	(m) Unit price.
C-i. pipe per ton.....	\$24.50	\$22.77	\$20.50	\$24.00	\$23.65	\$22.50	\$30.00
C-i. specials.....	60.00	58.00	100.00	57.00	56.00	60.00	62.00
4" c-i. pipe laid.....	.30	.28	.33	.37	.49	.50	.40
6" c-i. pipe laid.....	.35	.29	.40	.40	.51	.75	.55
8" c-i. pipe laid.....	.45	.47	.51	.44	.54	.95	.65
10" c-i. pipe laid.....	.70	.47	.66	.50	.60	1.30	.75
4" valves.....	15.00	12.00	14.10	11.50	14.00	11.00	23.00
6" valves.....	20.00	16.75	20.10	16.50	19.50	18.00	26.00
8" valves.....	40.00	25.22	28.10	22.00	27.50	23.00	32.50
10" valves.....	40.00	34.86	37.10	31.00	37.50	30.00	45.00
Hydrants.....	35.00	34.74	43.25	28.00	34.00	35.00	32.50
Wells.....	1132.00	1204.00	937.50	1200.00	1100.00	500.00	750.00
Wells, extra depth.....	30.00	35.00	95.00	100.00	50.00	35.00	37.67
Stand pipe.....	4900.00	6264.00	5175.50	5150.00	5500.00	4400.00	4800.00
Pump station.....	2250.00	4009.00	4901.00	3127.00	4000.00	1790.00	3200.00
Pump gas engine.....	2100.00	2583.00	2409.00	2900.00	3100.00		2900.00
Pump motor.....	2100.00	1994.00	1677.50	3000.00	2800.00	4558.00	2900.00
Totals.....	\$41,459.50	\$41,644.39	\$42,953.20	\$43,243.40	\$46,931.50	\$48,848.50	\$49,417.17
						\$49,628.50	

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Alliance, Neb.—City may shortly purchase a 12-kva constant current transformer, 80 central support fixtures, wires and other material for series tungsten street lighting system; also pump with capacity of 1,000 gallons per minute, and erection of a 500,000-gallon reservoir. J. E. Hughes is superintendent.

Orleans, Neb.—City Council of Orleans has called special election for July 7 to vote bonds to amount of \$12,500 for purpose of purchasing lighting plant now owned by Orleans Light & Power Co.

New Brunswick, N. J.—Bids for lighting city streets for period of two years have been opened in Common Council and referred to committee on gas and lamps, with instructions to report to Council. Bids were as follows—for furnishing Regular Commercial Standard 2,000 candle power arc lamps: \$80 per lamp up to 250 lamps; \$75 per lamp from 250 up to 750 lamps; \$70 per lamp from 750 up to 1,250 lamps; \$65 per lamp from 1,250 up to 1,750 lamps; \$60 per lamp for all over 1,750 lamps. Or will furnish Regular Commercial Standard 1,200 candle power arc lamps—at a discount of 5 per cent. from rates for 2,000 candle power arc lamps. For furnishing electric type "W" flame operating 7½ ampere: \$120 per lamp up to 250 lamps; \$112.50 per lamp up to 750 lamps; \$105 per lamp up to 1,250 lamps; \$97.50 per lamp up to 1,750 lamps; \$90 per lamp for all over 1,750 lamps. Furnishing single mantle Welsbach lamps—up to 50 lamps, each \$26; from 50 lamps up to 150 lamps, each \$25; all over 150 lamps, each \$24. For two-mantle Welsbach lamps—Up to 50 lamps, each \$36.40; from 50 lamps up to 150 lamps, each \$35; all over 150 lamps, each \$33.60. For four-mantle Welsbach lamps—Up to 50 lamps, each \$70.20; from 50 lamps up to 150 lamps, each \$35; all over 150 lamps, each \$64.80. Municipal Open Flame lamps, \$18 per year for any number.

Red Bank, N. J.—Lighting contract with Public Service Electric Co. for Red Bank will expire on Feb. 15, 1915. Mayor and council have been appointed special committee to investigate matter of either renewing contract or with purchasing electric plant to be operated by boro. Present contract calls for expenditure of more than \$12,000 a year.

Bath, N. Y.—Plans for Bath's municipal lighting and power plant, as prepared by Engineer Larrowe, of Coshocton, are complete and will be presented to Village Trustees at their next meeting. Plans provide for power plant equipped with two dynamos and double steam engines; 117 Mazda lamps of 200 candle power, with 67 boulevard lights for use in business section, in parks and other places.

Buffalo, N. Y.—Council has approved of installation of 85 magnetic luminous arc lights on Genesee street, from Main to Jefferson streets.

Cincinnati, O.—Plans are under consideration by Main Street Merchants' Association for installation of ornamental street lighting system.

Loyalsock, Pa.—Property owners in Vallamont have petitioned for installation of a street lighting system. Plans provide for initial installation of 35 incandescent lamps.

Ogden, Utah.—Extension of "white way" lighting system to include 24th St. from Washington to Wall Ave., Grant Ave. between 24th and 25th Sts. has been assured.

Buckhannon, W. Va.—It is said that Ernest Phillips, of Buckhannon, would like to receive estimates on generator with storage battery, to maintain 100 to 150 lamps, and gasoline engine.

Moundsville, W. Va.—A new movement is on foot to place number of cluster lights on Seventh St., also on Lafayette Ave. Lights will be of regular city style if erected and will be large number on streets. Current will be furnished by Wheeling Electric Co., and when installed will add much beauty to this section of city.

CONTRACTS AWARDED.

Oakland, Cal.—After discussion of merits of various glass globes, City Council has awarded contract for furnishing electric light fixtures for new city hall to Roberts Manufacturing Co., of Oakland and San Francisco, whose bid of \$6,350 was lowest received. Other competing firm, Maxwell Hardware Co., bid \$6,995.

San Francisco, Cal.—Board of Works has awarded contract for furnishing and installing overhead electrical conductors for Municipal Railway line to lowest bidder, H. S. Tittle, for \$36,245, and will receive bids on June 24 for underground electrical conductors and appurtenances.

Waterbury, Conn.—For mechanical equipment, consisting of light, heat and power plant, for new municipal building by city hall commission to George A. Fuller Co., of New York, N. Y., at \$104,145.

Holyoke, Mass.—Bid of Safety Insulating & Wire Cabling Co. to put in cable for new police signal system has been accepted by Board of Public Works. Figure was \$7,185.60. Other bidder was the Gamewell Police & Fire Signal Telegraph Co.

Lebanon, Pa.—Borough Council of Myerstown has awarded five-year contract for lighting borough to the Edison Electric Illuminating Co., of this city, who will furnish electric current in compliance with specifications. Specifications call for incandescent lights of 32, 60 and 80 candle power and 80 lights will be kept lit. Rate for 32 candle power lights are same as that quoted to this city, namely \$15.

Seattle, Wash.—For furnishing transformers to Allis-Chalmers Mfg. Co., at \$10,500.

FIRE EQUIPMENT

Atlanta, Ga.—Purchase of six motor combination chemical and hose wagons, three tractors, two motor pumping engines, one motor aerial truck and one motor service truck has been recommended by National Board of Fire Underwriters. W. B. Cummings, Chief.

Tifton, Ga.—Bond issue of \$7,000 has been authorized for purchase of motor combination chemical and hose wagon and for installation of alarm system.

Davenport, Ia.—Ordinance has been passed authorizing fire committee to advertise for bids for new auto for Chief Peter Denger, to cost \$3,500.

Cumberland, Md.—Fire Commissioners will readvertise for fire hose bids and give specifications.

Pittsfield, Mass.—Sum of \$5,500 is recommended for purchase of new auto chemical for fire department.

Quincy, Mass.—Purchase of tractor for Engine 1 to cost \$12,800 has been recommended.

Havre, Mont.—Bids have been advertised for purchase of combination hose and chemical motor car. S. L. Hanley is City Engineer.

Burlington, N. J.—Ordinance is being considered calling for purchase of motor hose wagon for Niagara Fire Co.

Plainfield, N. J.—Common Council has received bids for furnishing automobile combination pumping engine and hose carrier with chemical tanks. Nine bids were submitted and five of these were from Nott Engine Co. Nott proposals were as follows: Large engine, regular price, \$12,000—\$11,000; Nott engine similar to one now in use here, \$7,500; Nott engine, hose carrier and chemical apparatus, \$8,000 and \$10,000; Nott engine, \$10,450; Lawrence Fire Engine Co., \$6,500; Boyd Brother Engine Co., \$8,500; Robinson Engine Co., \$7,850, and another at \$7,200; Lent Engine Co., \$7,750.

Cornwall, N. Y.—Election will be held June 30 for voting on appropriation of \$7,000 for motor fire truck.

Homer, N. Y.—Election will be held June 22 for voting on appropriation for purchase of motor chemical wagon.

Liberty, N. Y.—It is proposed to purchase auto chemical engine for Hallock Hose Company.

Niagara Falls, N. Y.—Seven bids were received by Fire Board for motor tractor for hook and ladder truck at fire headquarters. Bids: American and British Manufacturing Co., Providence, R. I., \$4,200; Front Drive Motor Co., Hoboken, N. J., \$3,800; Ahrens-Fox Co., Cincinnati, \$5,500; American-LaFrance Engine Co., Elmira, \$5,000; Niagara Falls Auto Co., \$4,200; C. J. Cross Front Drive Tractor Co., Newark, N. J., \$4,000; Couple Gear Front Wheel Co., Grand Rapids, Mich., \$5,400.

Erie, Pa.—Bonds in sum of \$12,000 for purchase of equipment of Fire Department will be sold at 10 a. m., June 29. T. Hanlon is City Clerk.

Pottstown, Pa.—Two new auto combination fire fighting machines will soon be added to Pottstown fire department.

Austin, Tex.—Bonds in sum of \$75,000 for fireboat have been approved.

Port Arthur, Tex.—Election will be called for voting on proposition to issue bonds for \$25,000 for purchase of piece of motor apparatus and additional hose, and installation of alarm system.

Lynchburg, Va.—Sum of \$11,600 has been appropriated for purchase of equipment for new West end fire station.

Puyallup, Wash.—Purchase of fire truck has been authorized.

CONTRACTS AWARDED.

Phoenix, Ariz.—Contract has been awarded to Seagrave Co. of Columbus, O., for three motor-driven combination hose and chemical wagons at total price of \$17,175.

Pomona, Cal.—Contract has been awarded to American-LaFrance Fire Engine Co. of Elmira, N. Y., for fire engine to cost about \$9,000.

Southport, Conn.—Contract for building of new Southport Volunteer Fire Department's house has been awarded to Charles M. Banham & Co. of Stamford. Building will be a handsome structure and will cost about \$5,000.

New Bedford, Mass.—Committee on Fire Department has reported that it had secured bids for 2,000 ft. of fire hose in accordance with specifications prepared by Chief of Fire Department. Eleven bids were received. Committee asked authority to expend from appropriation standing to credit of account "Fire Department," sum of \$1,250 and also for authority to contract with the C. C. Fire Hose & Rubber Co. in accordance with its bid of 62½ cts. per foot. Recommendation was adopted.

Goshen, N. Y.—Committee in charge of purchasing motor fire extinguishing apparatus for Cataract Engine and Hose Company has completed its plans. Engine which committee has selected is manufactured by American-LaFrance Company at Elmira, and is triple combination, costing \$8,000.

Stroudsburg, Pa.—To James Boyd & Bro., Philadelphia, Pa., for motor combination chemical and hose wagon, equipped with two 40-gallon chemical tanks at \$5,800.

Fort Worth, Tex.—To Eureka Fire Hose Co. for 5,000 ft. of 4-ply hose, at \$1.20 per ft.

BRIDGES

Eufaula, Ala.—A movement is on foot to have old bridge which crosses Barbour Creek on National Highway replaced by modern concrete structure.

Napa, Cal.—Bonds in sum of \$25,000 have been voted for new bridge over Napa River on East First St.

Muscataine, Ia.—A \$25,000 improvement is in contemplation in Mad Creek bottoms according to information which is given out at office of City Engineer Charles Young. Construction of culvert 260 feet in length with sixty-foot span near East Second St. is under discussion.

Boston, Mass.—Appropriation of \$110,000 has been made to replace Wellington bridge.

Cleveland, O.—County Comrs. will prepare plans for third high level bridge over Cuyahoga River to cost about \$3,000,000.

Northampton, Pa.—Plans are approved for new bridge by Bucks County Commissioners in Northampton Township on road from Churchville to Holland station over Ironwork Creek.

Vancouver, B. C.—Plans have been submitted to City Engineer for concrete bridge to be constructed over Coal Harbor at cost of \$180,000.

CONTRACTS AWARDED.

South Bend, Ind.—For construction of new concrete bridge over St. Joseph River on North Michigan St. to Cleary, Kuert Co., of Indianapolis. Total bid for construction of new bridge, \$93,663; for construction of temporary structure, \$3,300, and bid of \$950 for demolishing of present structure.

Council Bluffs, Ia.—By Board of Supervisors to Lana Construction Co. of Council Bluffs for bridges, grading and concrete culverts, to cost about \$25,000.

Cottonwood Falls, Kan.—By County Commissioners contract for construction of new bridge across Cottonwood River at this place to Missouri Valley Bridge & Iron Company, at cost of \$13,700.00.

Hackensack, N. J.—The Bergen County Board of Freeholders has awarded contract for construction of proposed bridge over Passaic River at point in Wallington opposite Eighth St., Passaic, to F. R. Long Co., for \$71,397.

MISCELLANEOUS

Huntsville, Ala.—Purchase of incinerator is being discussed.

Oakland, Cal.—Oakland's municipal auditorium will be completed, second election for issuance of \$500,000 in bonds for that purpose having been carried.

Sacramento, Cal.—City Commission has agreed to secure services of Dr. John Nolen, of Boston, who is drawing up plan of city parks, to devise plan of city development at cost of \$3,250.

MUNICIPAL JOURNAL

WEEKLY

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No. 26

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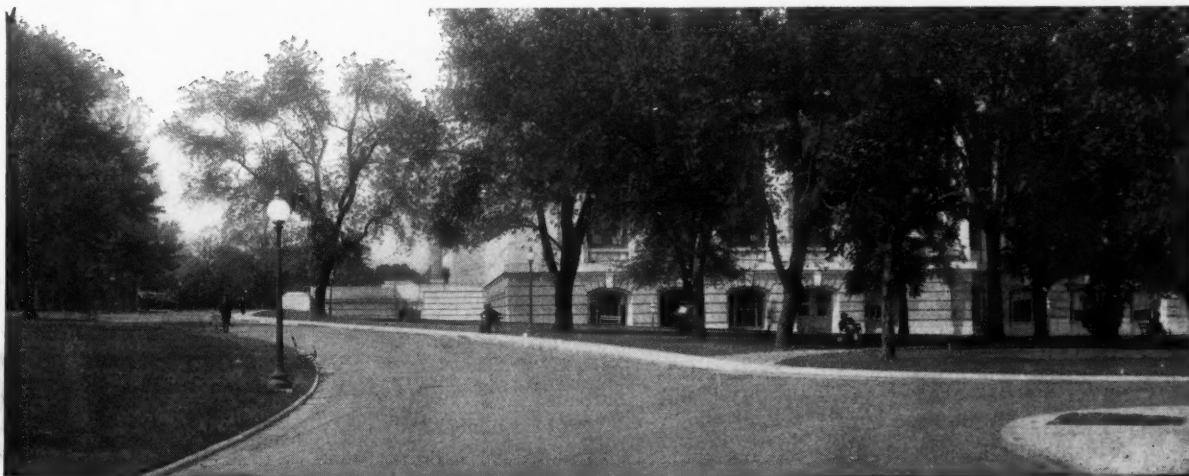
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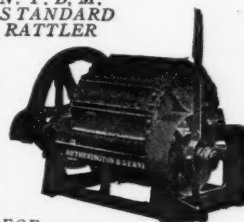
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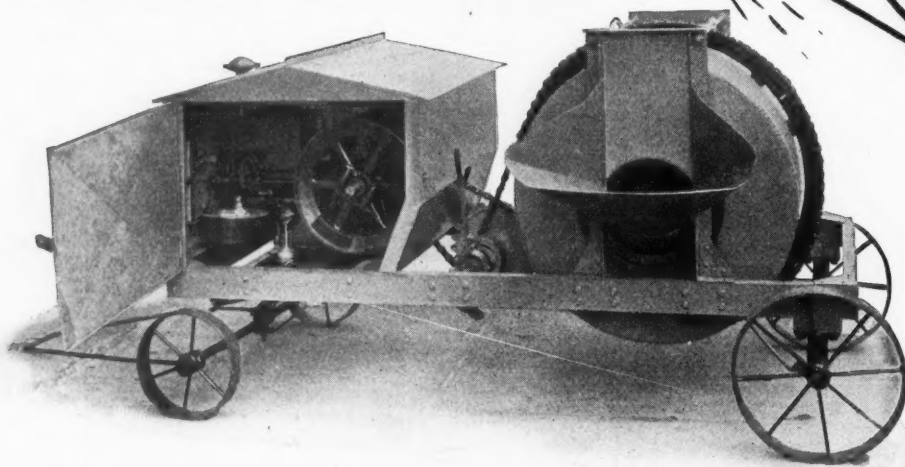
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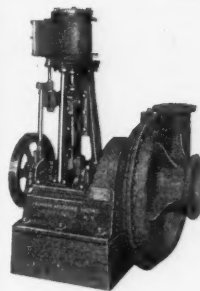
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MORRIS MACHINE WORKS

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CENTRIFUGAL PUMPS

for Water Works, Pumping Sewage, Dewatering Trenches, Pumping Out Flooded Cellars, for Fire Purposes, etc.

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FILTERS

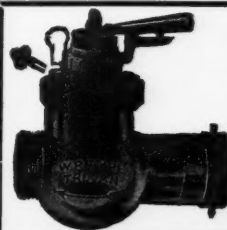
Hypochlorite Apparatus and Water Softening Plants

The New York Continental Jewell Filtration Company

111 Monroe Street, CHICAGO

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Owners of the NEGATIVE HEAD FILTER PATENTS



The Ross Independent Combination Operating and Regulating Valve

Can be attached to any High Pressure Hydrant. It protects Firemen and enables Shut off Nozzles to be used on any high pressure line. Write for specifications and prices.

ROSS VALVE MFG. CO., Troy, N. Y.



Try this Tapping Machine at our Risk

Can be carried by one man—a great advantage when you find openings are to be made.

Let us send one and a few samples of our Brass goods on trial.

The A. P. Smith Mfg. Co.

EAST ORANGE, N. J.

KEEP YOUR PLANT UP TO DATE

Good results depend on good equipment. This page is a directory of good water works equipment. These firms offer products to increase the efficiency of your system and to save money in your plant. When you need equipment—the most improved and the best—these firms are ready to put their experience at your disposal.

If there is any equipment you cannot find on this page or in the paper, write us and we will give you the names of the manufacturers. Address

Information Bureau

MUNICIPAL JOURNAL

50 Union Square, New York

KING DISC METERS

Evolved From Fifty Years Meter Building Experience

King Meters stand strain of heavy duty.

King Meters have large Discs, thus nutations, compared with other makes, few to Cubic Foot, consequently wear less.

King Meters have all working parts, excepting Register assembled in single unit, rendering them accessible without removing Meter from service pipe.

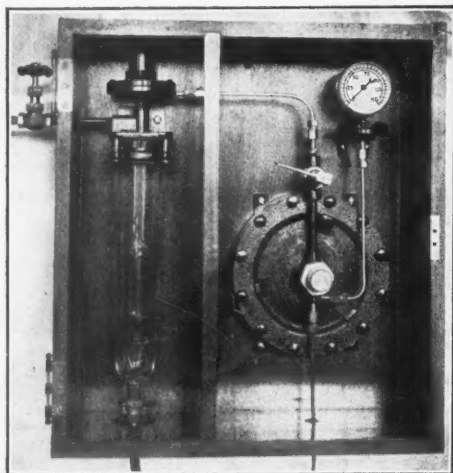
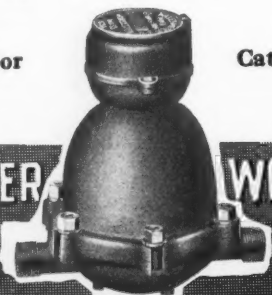
King Meters operate Noiselessly.

King Meter Workmanship and Material fully Guaranteed.

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UNION WATER METER CO. WORCESTER MASS.



"Not Only
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Experience"

CHLORINE APPARATUS

Water and Sewage Disinfection

Simple Operation—Chart saves computations.

Simple Design—No moving parts.

Accuracy—Chlorine measured accurately by special meter.

Low Cost—Both of operation and maintenance.

Made in six types—manual or automatic control, direct or solution feed. Portable Emergency Outfits.

WALLACE & TIERNAN CO., INC.
136 Liberty Street, New York City.

To Permit Typhoid

To Exist In Your City is a

CRIME

LIQUID CHLORINE

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FOR

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Insures a Safe water at all times. SANITARY ENGINEERS acknowledge this to be the MOST EFFICIENT PROCESS.

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Pioneer Manufacturers of Liquid Chlorine

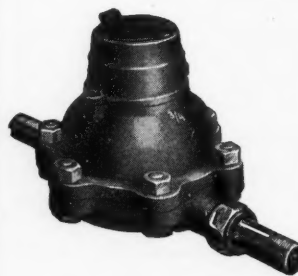
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NEW YORK CITY

AMERICAN and NEW NIAGARA WATER METERS

SPECIFICATIONS.

Dirt and Sand Proof
Submerged Bearings. Re-
inforced Measuring Disc.
Jewel and Pivot Bearing
Gears. Regulator for
Pressures. Only Seven
Submerged Working
Parts. These and other
features explained in new
catalog.



BUFFALO METER CO.

Established 1892

290 Terrace, Buffalo, N. Y.

CHLORIDE OF LIME

AND

LIQUID CHLORINE

FOR

Water and Sewage Purification

Pennsylvania Salt Mfg. Co.

PHILADELPHIA, PA.

Issue Warnings of Water Waste.

(From Municipal Journal, June 18, 1914.)

Greensboro, N. C.—Commissioner J. Giles Foushee says the people of Greensboro are using an excessive amount of water by a million or more gallons a day. Every day since the first of June the people have used 2,500,000 gallons. There is plenty of water, but it cannot be filtered quickly enough. It is contended that 1,250,000 gallons—40 gallons to each person—should be enough. Mr. Foushee asks that the people keep within the limit.

Newcastle, Ind.—Superintendent Younce of the City Water Works has announced that the rules for sprinkling and other uses will have to be enforced, as the drain on the reservoirs has reached a point where it is dangerous, and in case of a big fire a great loss would likely result. During the past few days the plant has pumped about 2,000,000 gallons daily. An investigation has been conducted and several instances of rank violation of the water rules have been found.

Altoona, Pa.—According to Director H. T. Corman of the Department of Public Property, Altoona is not likely to be troubled with a shortage of water if the people will be reasonable in the amount they use. The officials believe that many people are wasting the water, for the consumption is much larger than it should be, and it is with difficulty that the distributing basins are kept filled.

Chicago, Ill.—In a communication to the City Council, Mayor Harrison denounced Chicago's waste of water as a "municipal crime." The Mayor urged the Council to bring about the installation of water meters as a means of conserving the water supply and placing rates on a more equitable basis. Mayor Harrison said that the city pumps millions and millions of gallons of water which is of benefit to no one.

Why the Water Officials of Four Cities Are Worrying

Greensboro, N. C., Newcastle, Ind., Altoona, Pa., and Chicago, Ill., are up against the summer problem of **water waste**. Famine is beginning to show itself while the citizens merrily sprinkle away and let their hydrants run all day. Millions of gallons are being wasted and the water superintendents are worrying. **Mayor Harrison of Chicago knows the remedy for waste.** He is urging the council to bring about the installation of **meters** to conserve the water. These are only four out of hundreds of cities in the same plight. **Do you know what Mayor Harrison knows?**

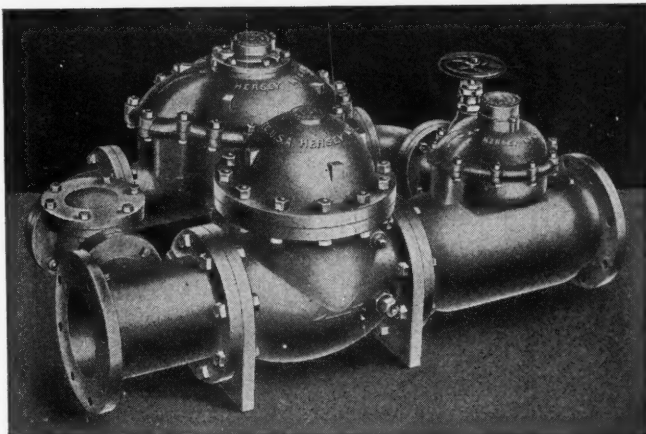
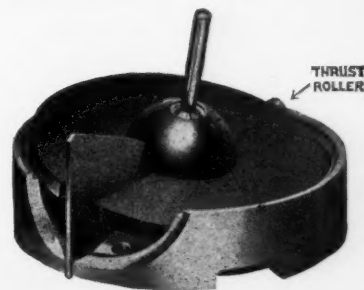
"Metering Reduces Waste—The TRIDENT Proves It"

You may put two meters on every service—and it won't do any good if they are cheap, poor meters. The **piston** must be **strong** and stand high speed. The **Trident Patent Thrust Roller** takes up the pressure and **saves the meter.**

Prof. Edward W. Bemis, public utility expert, has written an authoritative book on "Water Meters." Send for a free copy now.

NEPTUNE METER CO.

90 West Street, New York



**STOP WHOLESALE LOSS! Use the
HERSEY DETECTOR METER
ON FIRE AND MANUFACTURING SERVICES**

THIS IS THE ONLY METER
Endorsed by Water Departments and Underwriters,
Because it registers all large flows.
Because it registers all small flows.
Because it does not obstruct the flows.

HERSEY MFG. COMPANY
Main Office and Works: **SOUTH BOSTON, MASS.**

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Philadelphia: The Bourse. Buffalo, N. Y.: 806 White Bldg.
Chicago, Ill.: 10 South La Salle St. Atlanta, Ga.: 3d Nat. Bank Bldg.
San Francisco: 461 Market St. Los Angeles: Marsh-Strong Bldg.
New York City: 174 Fulton St.

"ALL KINDS OF METERS FOR ALL KINDS OF SERVICES"

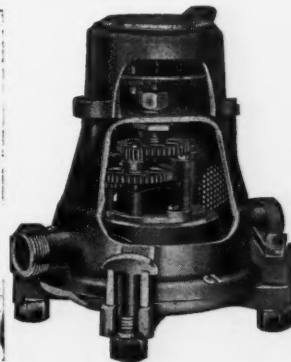
500,000 SOLD

**—INSPECTION IS EASY
AND SO ARE REPAIRS—BECAUSE**

of the unit construction and accessibility of every Badger part—maintenance expenses are reduced to the minimum. All working parts can be removed without line disturbance. Frost bottom plate can be replaced at a cost of but few cents. Any repairs found necessary can be made on the spot. The proof is the simplest—We'll send you Test Sample direct from stock.

**BADGER METER
MANUFACTURING CO.**

261-265 Third St., Milwaukee, Wis.



PITTSBURGH METER CO.

**Water & Gas
METERS**

**General Office & Works
EAST PITTSBURGH, PA.**

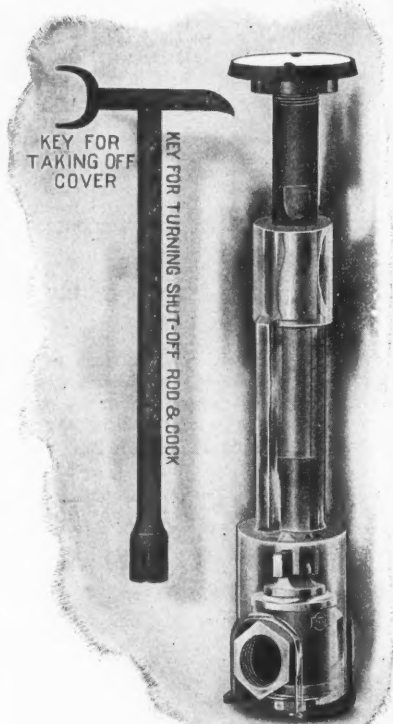
DISTRICT OFFICES
New York Chicago
Kansas City
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Eliminate Your Cover Troubles

This Box is fitted with a cover that has no bolt or screw.

The Box where the curb cock is **always at easy access.**

Our new combination key can be used with both Hays and open type of curb boxes.



Also made in Minneapolis Pattern.

HAYS MFG. COMPANY, Erie, Pa.

Cut Your Cutting Costs

—THE STRICKLER RATCHET PIPE CUTTER

CUTS ANY STEEL, WROUGHT OR CAST IRON PIPE (24" to 30" in diameter inclusive) **BY HAND!** In the trench or in the shop! Quickly placed on pipe and needs but nine inches for clearance!

—**Made in Eight Sizes**
Each Size Cuts a Range of Sizes

- Clean, square, lathe cuts every time and no broken sections.
- No burrs or ragged edges.
- No filing or reaming required.
- Cuts from any position.
- Made in a range of sizes.
- Each size cuts a range of sizes.
- Try it at our expense.



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Grant and Buckingham Sts., COLUMBUS, O.

Specify WARREN CAST IRON PIPE

The economics of investment demand Cast Iron Pipe and Fittings as the Basis upon which securities may be issued upon any Water or Gas Enterprise.

Warren Cast Iron Pipe and Fittings have been recognized as being the best in quality over a period of 58 years.

Our Motto always has been (and is now) "QUALITY FIRST."

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Large Stock always on hand insures Prompt Delivery.

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Prices and Service Satisfy All*

Warren Foundry and Machine Company

11 Broadway, New York
Works, Phillipsburg, N. J.

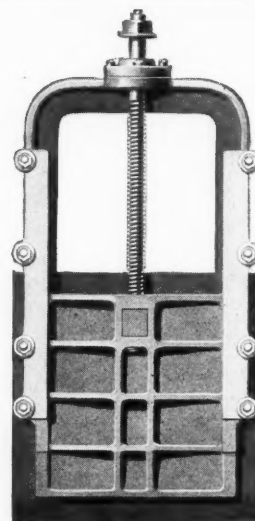


FIG. 4.

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**Sluice, Head and Penstock Gates,
Flap and Shear Valves.
Flexible Joints.**

Our gates have stood the test of time, several having been in operation over twenty-five years.

Give us a trial order.

COLDWELL-WILCOX CO.

Box 574.

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400,000,000 Million Gallons of
PURE WATER
 furnished by
Pittsburgh Filter Plants



FILTRATION PLANT, WACO, TEXAS

Nearly 100 Cities Supplied

BIG PLANTS WITH DAILY CAPACITIES RANGING FROM ONE HALF MILLION TO 160,000,000 GALLONS.

Gauges, Controllers, Operating Tables, Hypo. Plants. Everything for Pure Water

Manufactured by

PITTSBURGH FILTER MFG. CO.
 KANSAS CITY, MO. PITTSBURGH, PA.

ABSOLUTE RELIABILITY AND OPERATING ECONOMY ARE THE MOST ESSENTIAL REQUIREMENTS OF

PUMPING ENGINES

The great number of Allis-Chalmers Pumping Engines in continuous service, 365 days a year, demonstrates their **RELIABILITY**.

Official duty tests and published annual reports of station operating costs prove their **HIGH ECONOMY**.

*Is There Any Municipal Problem
 of Greater Importance
 Than the Water Supply of a City?*

Allis-Chalmers Manufacturing Company

Pumping Engine Department, Milwaukee, Wis.

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**Cast-Iron Gas
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Flange Pipe, Special Castings

**MANHOLE FRAMES AND
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*Fire Hydrants, Valves,
 Sluice Gates, Lamp Posts*

General Foundry and Machine Work

Supplies for Gas and Water Works, Railroads,
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253 Broadway, NEW YORK



Are You Pumping Water Through a Pipe Like This?

If so, you are taking a great fire risk, you are wasting pumping power and giving bad service. A clean pipe means increased fire protection, decreased pumping expenses and the limit of good service.

The "National" way uses no chemicals.

A few results out of hundreds:

Cincinnati, O.—Main capacity increased 125%.
 Nantucket, Mass.—125 gals. per min. increased to 375.
 Mt. Vernon, Ill.—Saved 27.7% power for pumping.
 Brooklyn, N. Y.—Discharge increased 153%.

NATIONAL WATER MAIN CLEANING CO.

61 Park Row

NEW YORK



Before

CLEANING AT NEWPORT, KY.

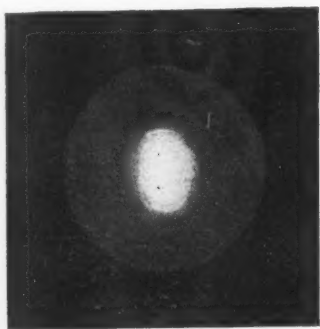
After

LIGHT UP

BUT DO IT

THE RIGHT WAY

THE appearance of ornamental lighting is often ruined by the use of the wrong kind of glassware. Glass balls, which in the daytime carry out the symmetry of an ornamental column—at night become ridiculously small splotches of light, *like this*



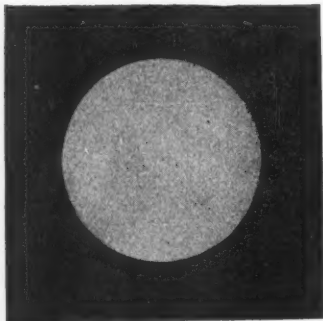
USE POLYCASE GLASS

REGISTERED

and you will have

UNIFORMLY LUMINOUS BALLS OF LIGHT

like this



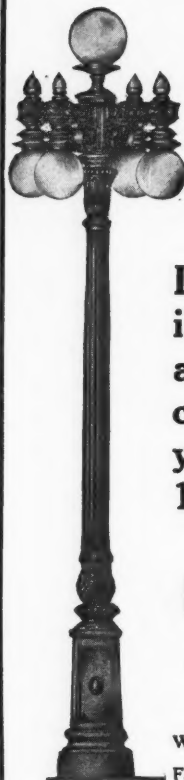
When **POLYCASE** balls are used the glass itself becomes the source of light, owing to the remarkable diffusing qualities of this glassware. In addition **POLYCASE** glass absorbs very little light.

GLEASON-TIEBOUT GLASS CO.

71 West 23rd Street,

NEW YORK CITY

"Experience is the Best Teacher"



200 Cities are using our Lighting Standards. The data in connection with them is at your command

If you want your streets illuminated effectively and with Standards of correct design, let us give you the benefit of our 15 years of experience.

Morris Iron & Steel Co.

J. W. BACHE

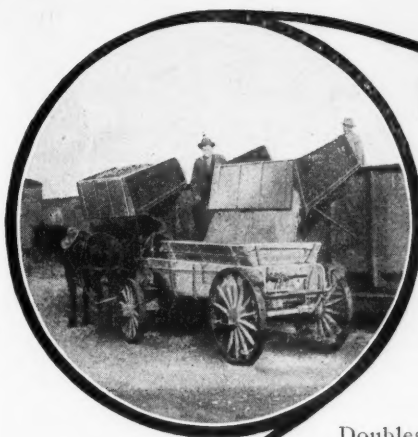
General Eastern Agent,
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TELEPHONE 81 SPRING
ESTABLISHED 1871



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ROCHE**
**QUICK
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CAR CHUTE**
**SAVES
\$6.
PER CAR**

Doubles the work of wagons and motor trucks. Unloads crushed rock, sand, gravel etc., from car at rate **a wagon per minute**. Comes ready for use; simply hook 'em on the car and that's all. Keeps shovelers, drivers and teams busy all the time.

Cuts Out Time of Team at Cars

No loafing or stalling on the job.
Made of steel plate and angle iron; nothing to wear out.
Weight 225 to 325 lbs.; easily handled.
1½ or 1 cubic yard capacity; order to fit your wagon.

The Maximum Unloading Results

at the minimum cost is yours!

NO SECRET ABOUT THE PRICE.

1 cubic yard capacity chute costs \$50.00 F. O. B. Louisville.

1½ cubic yard capacity chute costs \$60.00 F. O. B. Louisville.

Freight charges from 80c to \$2.50 per chute.

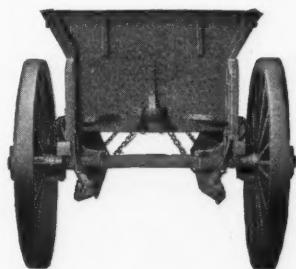
WIRE YOUR ORDER AT MY EXPENSE.

Shipment made same day.

THOMAS M. ROCHE

Road Building Materials and Machinery
829-830 Monadnock Bldg., Chicago, Ill.

Would You Rather Buy



cheap wagons and have to replace them in two or three seasons or would you like Watsons (costing a little more), good for five to eight years' service?

The difference in price is very small; the difference in service is several years. Then there's the item of repairs. If you pay the bills, better get the Watson catalog.

WATSON WAGON COMPANY
CANASTOTA, NEW YORK

The World's Largest Builders of Dumping Wagons.

BRANCH OFFICES:

256 Broadway, New York, N. Y.

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Hospital, Ft. Wayne, Ind. Equipped with A-S Machine for Ice Making and Refrigeration.

Improve Sanitation in Your City Institu- tions by Installing the **JM System of Refrigeration**

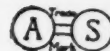
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Proper refrigeration in such public buildings as city markets, hospitals, prisons, asylums, lodging houses, etc., is absolutely essential for safeguarding health.

The J-M System, using a simple, automatic refrigerating machine that requires no dangerous chemicals or gases, is perfect for this purpose. It maintains a dry, pure, uniform cold at 35 to 40 degrees Fahrenheit. Also manufactures ice at the rate of 11 to 110 pounds per hour, and distributes pure drinking water to sanitary porcelain bubble fountains at a health-giving temperature.

Write our nearest Branch for interesting new Catalog.

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2552

Metropolitan

Union Foundry Quality Is Truest Economy

Not only because the best is always the cheapest, but also because lighting standards made of HIGHEST GRADE CAST IRON actually cost less by length of wear and service.

The Union Foundry Co.'s Chemist, based on his own analysis of pig iron, arranges daily, the iron mixtures used in all their Ornamental Castings. The result is the greatest possible STRENGTH and DURABILITY of Union Foundry Co. standards.

Before you specify, study Union Foundry Specifications—That's the acid test that can't be met. Make sure of satisfactorily long service, beforehand, then you won't have to look later to see what is missing. Let us send you the particulars with photographs and blue prints.

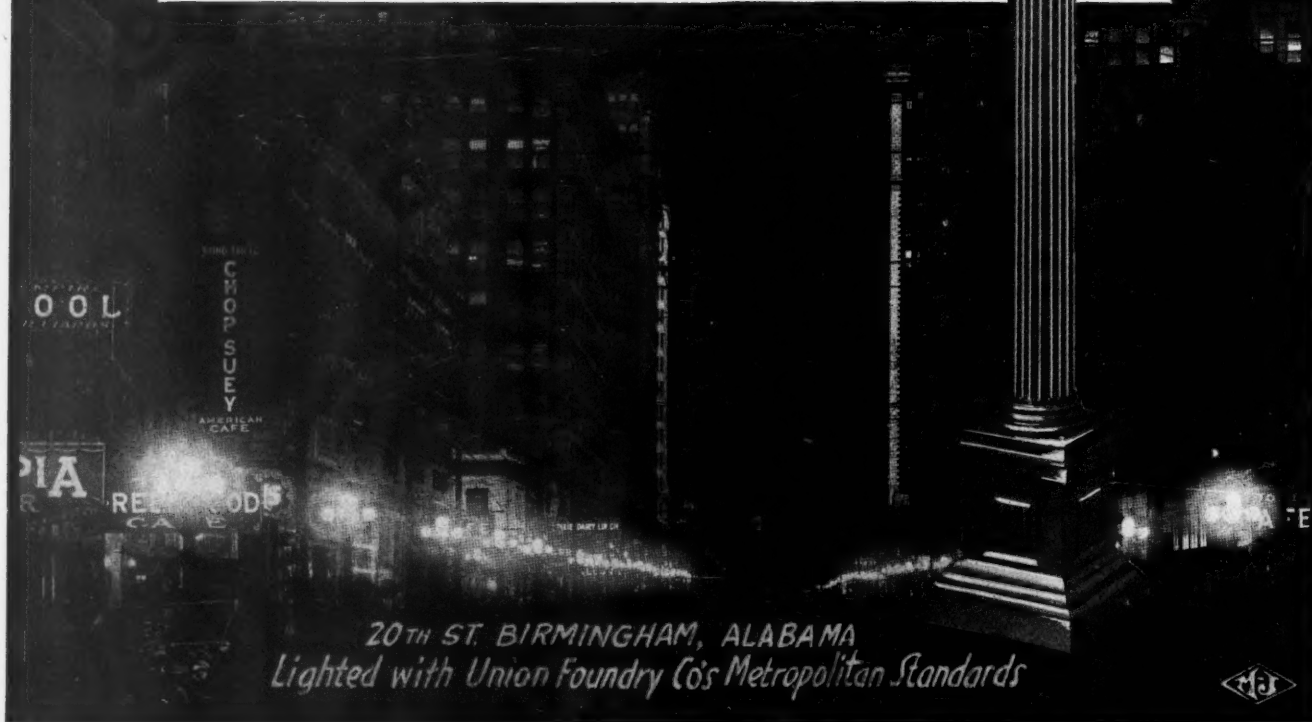
Union Foundry Company

Manufacturers of

Highest Grade Cast Iron
Ornamental Standards and Brackets

ANNISTON,

ALABAMA



20TH ST. BIRMINGHAM, ALABAMA
Lighted with Union Foundry Co's Metropolitan Standards



JOHN BAKER, JR.

Star Brand CALIFORNIA ASPHALT

BEST FOR PAVING AND ROAD BUILDING

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Representatives Throughout United States and Canada.

Write For Particulars



**GLUTRIN.
REG. U. S. PAT. OFF.**

Sprinkling macadam streets once in a while with a very small amount of glutrin,

Gives a continuous dust-laid condition that no amount of watering could give;

Makes them increasingly tighter in contrast to the disintegrating effect of too much water;

Saves in water and labor, the cost of the glutrin,

And gives a surface that can be gone over with a horse-drawn sweeper instead of the much more expensive hand-broom method.

Glutrin is not an oil nor a bitumen, and will not injure anything that will stand water.

Robeson Process Company

General Offices

PENNINGTON, NEW JERSEY

Chicago, Ill.—An appropriation of \$1,734,000 for rehabilitation of police and fire department ordinance has been recommended to City Council by finance committee. Of this amount \$1,159,000 is to be spent for police stations and \$575,000 for fire stations.

Albany, N. Y.—Messrs. Hering & Gregory, Consulting Engineers, New York City, have been retained by Board of Contract & Supply to investigate and report on best method of collecting and disposing of garbage, rubbish and ashes of city.

Binghamton, N. Y.—Board has authorized advertising of \$70,000 worth of Front St. dyke bonds, to be sold at 11 o'clock on July 13.

Brooklyn, N. Y.—Bids have been opened by Commission for Section 1 of Eastern Parkway subway in Brooklyn. This begins at end of present subway at Atlantic Ave. and runs under Flatbush Ave. to join Section 1A, a little to southeast of St. Mark's Ave. It also includes stretch of Brooklyn Rapid Transit subway to connect Fourth Ave. with Brighton Beach line, which begins under Fulton St. near Ashland Pl., curves into St. Felix Pl. and runs under that thoroughfare to near Hanson Pl. There were ten bidders, lowest three according to unofficial tabulations being Cranford Co. with \$2,195,000, E. C. Moore with \$2,289,000, and the Degnon Contracting Co. with \$2,301,000.

Columbus, O.—Equipment of workhouse farm at cost not to exceed \$150,000, is provided for in ordinance introduced in council.

Eugene, Ore.—Purchase of second street flusher is being considered.

Erie, Pa.—Bonds in sum of \$101,000 for purchase of public parks, and \$10,000 for rebuilding City Hall will be sold June 29. T. Hanlon is City Clerk.

Warwick, R. I.—Warwick Town Council has sold entire issue of \$350,000 30-year gold bonds to N. W. Harris of Boston, the highest bidder, for \$354,994.50.

Austin, Tex.—Attorney General has approved bonds for city of Galveston aggregating \$525,000 as follows: Fire boat, \$75,000; municipal buildings, including city hall, \$300,000; paving and street improvements, \$150,000.

CONTRACTS AWARDED.

Alton, Ill.—Contract for auto ambulance and patrol wagon has been awarded to Hudson Co., at \$2,600.

Newark, N. J.—Contract with Holbrook, Cabot & Rollins Corp., of New York, to build foundation for proposed new terminal of Public Service Newark Terminal Railway Company in Park Pl. and subway connecting with it has been executed. Work calls for an expenditure of \$619,000.

New Brunswick, N. J.—To George B. Rule, local contractor, for remodeling and repairing County Court House, at \$67,590.

New York City, N. Y.—Construction contract for section of Lexington Ave. subway from 53d to 43d St. has been awarded by Public Service Commission to Rapid Transit Subway Construction Co., the Interborough subsidiary. Company bid \$1,915,164, and was \$111,042

lower than next bidder, the MacArthur Bros. Co.

Urbana, O.—Chapman Brothers, of Celina, have secured contract for dredging Mad River at its bid of \$34,975, which is 15½ per cent. less than engineer's estimate on work, \$41,162.

Fort Worth, Tex.—Contract for new \$40,000 City Hall at Terrell has been let to Berry & Metcalf of Corsicana. Contract price for construction work is \$34,715. Heating and other equipment will bring total cost to approximately \$40,000.

Norfolk, Va.—Contract for two crematories, one single and one double unit plant, has been awarded to Nye Odorless Crematory Co., after consideration of various proposition submitted to Board of Control, the Nye bid being slightly in excess of that of Atkinson, Moss Destructor Co. Double unit plant will take place of Decarie plant in Norfolk, installed six years ago at cost of \$38,000, while single unit plant will be located in Berkley. Two units of new Nye crematory will take care of same gross tonnage at cost of only \$8,000. Single unit plant for Berkley with capacity of ten tons, with house, will cost \$4,500. Double unit plant for Norfolk without house, 12 to 20 tons capacity, will cost \$8,150. Bids of Atkinson-Moss Destructor Co. amounted to \$8,150 for two plans, Berkley, \$3,950, and Norfolk, \$4,200. Board figured that in view of fact that it is claimed that Nye furnace can be operated at cost of 42½ cts. per ton, and Atkinson-Moss furnace at 65 cts. per ton, economical plan would be to purchase more expensive plant.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS				
Ill.	Champaign	June 26	Paving with reinforced concrete and brick. (See Streets and Roads for details)	Board Local Improvements.
Ky.	Lexington	10 a.m., June 29	Paving several streets with various permanent material.	C. H. Wilkerson, Com. P. W.
Mass.	Gt. Barrington	Noon, June 30	Surfacing about 5,200 ft. of state highway	Highway Comm., Boston.
Utah	Fairview	8 p.m., July 2	Constructing cement sidewalk	J. L. Bench, Jr., C. E.
Ill.	Galesburg	4 p.m., July 2	Grading, curbing and paving with brick on concrete foundation, also storm water inlets and 380 feet of sewer for catch basin	Board Local Improvements.
Cal.	Sacramento	July 6	Constructing several roads of Portland cement concrete; also grading, etc., in several counties	State Highway Comm.
Ill.	Pekin	8 p.m., July 6	Grading, repaving and paving and other street railway work	S. R. Derrick, City Clk.
S. C.	Mt. Pleasant	July 6	Laying 900 yds. cement pavements	E. Tinken, Chr. St. Com.
Ind.	Niles	10 a.m., July 8	Grading, gravelling and macadamizing	Board Co. Comrs.
SEWERAGE				
Ill.	Champaign	2 p.m., June 26	Storm water sewer system. (See Sewerage for details)	Board Local Improvements.
N. J.	Linden	8 p.m., June 30	Constructing lateral connecting sewer	C. H. Smith, Boro. Clerk.
N. Y.	Brighton	June 27	Constructing water system, consisting of furnishing and laying about 26,000 ft. of pipe	Water Comrs.
Ia.	Sac City	June 29	Laying 1,183 ft. of 4-inch pipe	W. F. Weary, City Clk.
N. J.	Belleville	June 30	Furnishing cast-iron pipe	Town Clerk.
Ill.	Elgin	10 a.m., July 6	37,000 ft. of 6 to 15-inch sanitary sewer	M. H. Brightman, Engr.
N. D.	Park River	July 6	Laying 2,000 ft. of mains	City Council.
Neb.	David City	July 6	Furnishing deep well pump, double or single acting	L. I. Thompson, City Clk.
N. M.	Hagerman	July 15	Constructing water works system	Town Clerk.
LIGHTING AND POWER				
Conn.	Waterbury	8 p.m., July 1	Furnishing conductors	W. F. Moher, C. C.
O.	Seville	Noon, July 6	Erecting and completing electric light distribution system	S. D. Hall, Village Clerk.
La.	New Orleans	Noon, July 30	Wire and cable for drainage system	Sewerage & Water Board.
FIRE EQUIPMENT				
Ia.	Sioux City	June 27	500 ft. of 4-ply, 5-ply capped ends 2½-in. rubber hose with couplings	P. J. Wells, City Clerk.
Ill.	Blue Island	July 6	1,000 ft. of hose, hose jackets, clamps, etc.	F. Hohmann, City Clerk.
Cal.	Fresno	July 6	One motor hose wagon, steamer tractor, and chassis for two hose wagons	Board Trustees.
Ariz.	Douglas	8 p.m., July 6	Furnishing 500 ft. of 2½-inch cotton fire hose	J. A. Howell, City Clerk.
N. C.	Wilmington	Noon, July 7	Furnishing one motor-driven fire pump of 1,400 gallons per minute capacity for fire boat	W. F. Jones, Councilman of Public Safety.
Mont.	Kalispell	July 15	One motor-driven triple combination wagon	City Clerk.
BRIDGES				
N. J.	Hackensack	1 p.m., July 6	Constructing one bridge	Bd. Chosen Freeholders.
Pa.	Uniontown	Noon, July 8	Constructing reinforced concrete bridge	H. Kisinger, Co. Cont.
N. J.	Perth Amboy	2.30 p.m., July 13	Constructing steel and concrete culvert	Bd. Chosen Freeholders, New Brunswick.
MISCELLANEOUS				
Ill.	Chicago	Noon, June 30	Repairing boilers, castings, dead plates, etc.	Com. on Bldgs. Bd. of Ed.
Pa.	Philadelphia	Noon, July 1	Furnishing concrete mixer; hauling materials, etc.	M. L. Cook, Director.
Ill.	Waukegan	5 p.m., July 13	Furnishing 360 street signs	M. J. Douthitt, C. E.



THE HIGHEST QUALITY

For Street and Road Work

AZTEC LIQUID ASPHALT

Dust Layer and Road Preservative Combined in One

- A—For cold oil application.
- B—For hot oil application.

CONTRACTORS

Please write for quotations and further information

**The Interocean Oil Co.
The United States Asphalt Refining Co.**

90 West Street, New York

Chicago Philadelphia Baltimore Norfolk

STANDARD

**Refined
Mexican Asphalt**
Prepared in various
grades for

Sheet Asphalt Pavements

and

Bituminous Macadam Road Construction
by either the penetration or mixing
method.

Standard Asphalt Road Oil

Containing from 40% to 60% asphaltum
to keep down dust.

Specifications and other particulars on
application.

STANDARD OIL CO. OF NEW YORK

Road Oil Department

26 Broadway

New York

Concrete's the Thing Lehigh's the Cement



12 Mills
Annual Capacity
Over 12,000,000 Bbls.

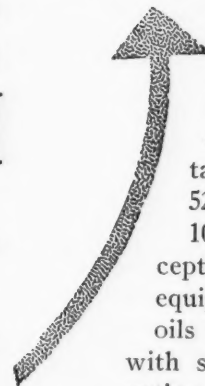
Lehigh Portland Cement Co.

ALLENTOWN, PA.

CHICAGO, ILL.

"The Last Word in Road Oils"

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CHELRECO LIQUID ASPHALT ROAD and FLUX OILS are sold in tank car lots only. We can furnish tank cars having capacities of 5200, 6400, 7200, 8000, 9300, and 10,000 gallons. All cars excepting the 9300 gallon ones are equipped with steam coils, so that oils can be heated in the cars with steam after arrival at destination.

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Samples
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Liquid Asphalt, Road Oils,
Flux Oils" will be sent you
upon request.

Chelsea Refining Company

H. P. ANDRESEN
District Sales Manager
City Hall Square Bldg., Chicago

Refinery: Chelsea, Okla.
General Offices: Tulsa, Okla.

STREETS AND ROADS

Gadsden, Ala.—A petition asking for street paving on Chestnut St., between Eighth and Ninth St., will be presented to City Council.

San Francisco, Cal.—Board has begun proceedings for grading, curbing, sewerage and paving San Bruno Ave., from Oakdale Ave. to Gaven St., cost being estimated at \$90,000.

Jacksonville, Fla.—Of proposed issue of \$2,250,000, sum of \$1,800,000 to be used for hard-surfaced roadways; \$150,000 to be used solely for funding outstanding indebtedness and \$300,000 for construction of specified reinforced concrete highway bridges.

North Vernon, Ind.—Issue of \$15,100 improvement bonds has been sold to First National Bank of Vernon for par and premium of \$111.25.

Des Moines, Ia.—Appropriation of \$12,000 has been made by State Board of Control for opening of road through campus at Iowa State College at Ames.

Atchison, Kan.—A resolution to pave North Third St., between Mound and Division Sts., has been passed unanimously.

Holyoke, Mass.—Bids for municipal and highway bonds for total of \$171,000 have been opened in office of Mayor John H. Woods, and award made in favor of Hayward Wilson of Boston, representative of Kean, Taylor & Co., of New York.

Perth Amboy, N. J.—It is proposed to pave Amboy Ave., from New Brunswick Ave. to Barclay St. with 3-in. asphalt blocks; from that point to Compton Ave. with improved granite blocks, and from that point to northerly boundary line of St. Mary's cemetery with asphalt blocks, according to ordinance introduced.

Binghamton, N. Y.—Plans are being drawn under direction of Division Engineer Howard E. Smith in local office of State Highway Department, for improved road to be constructed in town of Union, connecting macadam road through village of Endicott to town of Union corporation line, with Maine-Vestal macadam.

Binghamton, N. Y.—Board has authorized city clerk to advertise for bids to construct brick pavement on Prospect Ave., from railroads to Eldredge St.; concrete pavement on Water St. north of Noyes Island bridge; a brick pavement on Jarvis St., from Main to railroads, and brick or concrete pavement on Charles St.

Newark, O.—Cuyahoga County will add 60 miles of rural brick road to its 400 miles of similar pavement, according to 1914 road improvement plans announced. Minimum width of 16 ft. has been adopted for roads to be laid during coming summer and entire expenditure will be somewhat in excess of \$900,000.

Doylestown, Pa.—At special election voters of Warrington township, by one majority, decided in favor of bonding district for \$25,000, for permanent improvements of roads.

Pottsville, Pa.—Grooved wood paving is recommended to City Council for use on W. Market St.

Providence, R. I.—Resolutions providing for paving of approximately 12,000 feet, or about two and a quarter miles, of heavily traveled highways, all of them in southwest section of city, will be presented in Common Council by the Committee on Highways with recommendations of passage. Two of streets, totaling about 7,200 feet, will be recommended for paving with wooden blocks, and these two jobs will be the first of any considerable size which this type of paving has been used on. Asphalt paving will be recommended for 1,400 feet and bitulithic for about 3,300 feet. Prairie avenue, from Pearl street to Broad street, distance of about 6,000 feet, is to be recommended for wooden block paving, while same type has been selected for Dudley street, from Plain street to Eddy street. Summer street will be given asphalt pavement for its entire length of about 1,400 feet, under committee's plan, while Potter avenue, from Cranston street to Elmwood avenue, will be recommended for bitulithic. Distance to be paved is about 3,300 feet.

PROPOSALS

Corning, N. Y.

Bids will be received by the Commissioners of Public Works, Corning, N. Y., until 12 M., July 2, for paving of Market and State Streets. About 17,000 square yards of paving will be required.

WILLIAM O. DRAKE,
Supt. of Public Works.

NOTICE TO CONTRACTORS.

Sealed proposals will be received by the Village Council of the Village of Seville, State of Ohio, at the office of the Clerk of said Village until 12 o'clock, noon of MONDAY, JULY 6, 1914, for furnishing the necessary tools, labor and material for the erection and completion of an electric light distribution system for furnishing and transmitting electric energy for the purpose of light, heat and power in said village and for lighting the streets, alleys and public grounds therein in accordance with the forms of contract, proposals, plans and specifications on file in the office of said clerk, under the direction of the Village Council and under and by virtue of an ordinance of said Council duly passed on the 4th day of May, 1914. Said proposals will be opened and publicly read at the hour above specified.

All proposals must be addressed to the Village Council, Seville, Ohio, and be delivered to the Village Clerk by 12

o'clock, noon of the day specified, indorsed with the name of the bidder and marked "Proposal for Electric Light Distribution System."

Each bid must contain the full name of every company interested therein and must be accompanied by a bond in the sum of \$200.00 to the satisfaction of the Council, or a certified check on some solvent bank, as a guaranty that if the bid is accepted, a contract will be entered into within the time specified and its performance properly secured. Should any bid be rejected such check will be forthwith returned to the bidder and should any bid be accepted such check will be returned upon the proper execution and securing of the contract.

Bidders will be required to use the printed form of proposal which will be furnished upon application.

If the work bid for embraces both labor and material the same shall be separately stated with the price thereof.

The right is reserved to reject any and all bids.

By order of the Village Council.

S. D. HALL, Village Clerk.
June 22, 1914.

WATER IMPROVEMENTS AND REPAIRS.

Hudson, N. Y.

Sealed bids will be received until 7:30 p. m., July 22, 1914, by the Secretary of the Commission of Public Works, of the City of Hudson, N. Y., for furnishing material and labor necessary for water-proofing the old wall and constructing a six-inch reinforced concrete cut-off wall on the upstream face of the storage dam at Churchtown, N. Y., also repairing the outer face as described in the plans and specifications.

Copies of the plans and specifications are on file in the office of the Commission of Public Works and copies will be mailed upon receipt of Ten Dollars (\$10.00). This amount will be refunded upon return of plans and specifications in good condition.

The Commission of Public Works reserves the right to reject any and all bids.

M. J. O'HARA,

City Engineer.

HENRY M. JAMES,
Secretary, Commission of Public Works.

June 25 and July 2, 1914.

For Sale

Canadian Patent No. 154,634

Dated March 24th, 1914, on

The Harris Municipal Garbage Incinerator and Steam Generator

Address

J. B. HARRIS, Genl. Manager

No. 65 Life & Casualty Bldg.

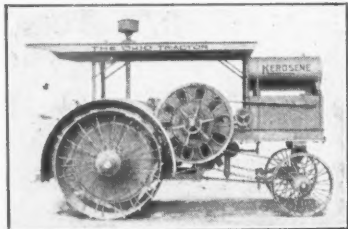
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ASPHALT PLANT—Cheap

Two-car Hetherington. Completely overhauled. In first-class condition and ready for use. Located near Chicago. Address, "Asphalt Plant,"

MUNICIPAL JOURNAL, 50 Union Sq., N. Y.



Use the Ohio Roller Tractor for Street and Road Work

Why use a steam roller with the attendant heavy expense for hauling coal and water? A 30 h.p. Ohio Roller Tractor, burning kerosene, gasoline or low grade distillate, will do anything a steam roller does and do it cheaper with the additional advantage of operating without smoke, sparks or soot.

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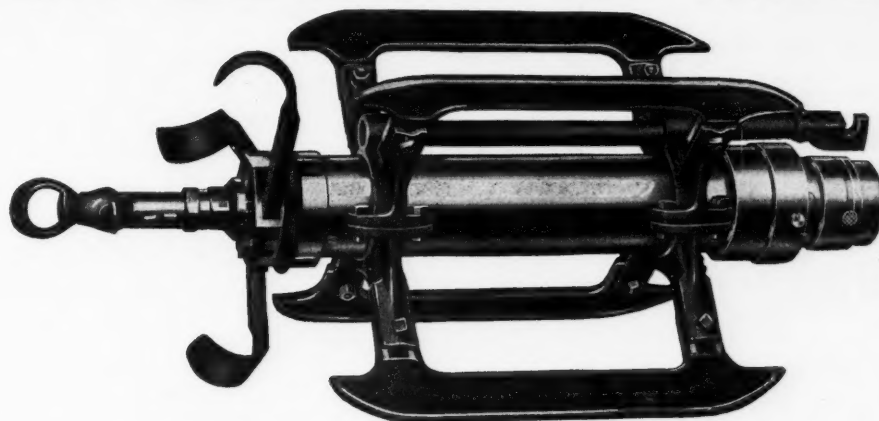
50 Church St., New York 857 People's Gas Bldg., Chicago 3rd Nat'l Bank Bldg., Atlanta, Ga.

Brunson Building
Columbus, Ohio

THE TURBINE

SEWER CLEANING MACHINE

*This
is the
Turbine*



*Cleans
Sewers at
3 1/2 c
per Lineal
Foot*

The Original and Only Successful Sewer Cleaning Machine

The Turbine is constructed to operate by either sewer rods or cable, as required.

In actual operation a hose is attached and when water pressure is turned on the cutters revolve and dislodge all material with which they come in contact.

Weeds, roots and other growths are cut while the other matter is ground into a grout, all of which is carried away by the force of the water.

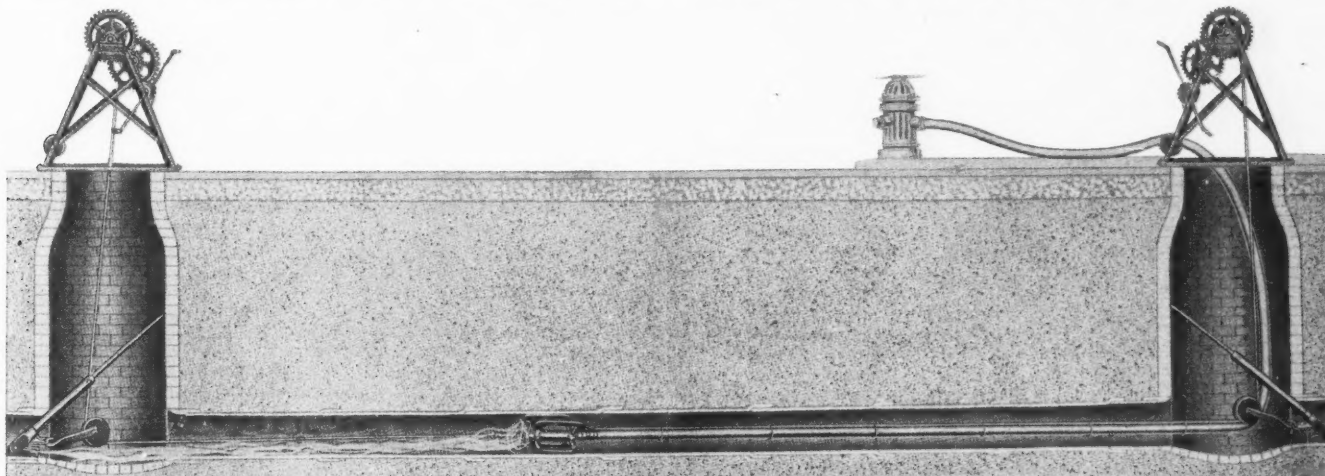
At the same time, the revolving cutters and action of the water thoroughly clean and scrub the entire inside of the sewer. The application of 60 pounds water pressure to the Turbine delivers

3 H. P. at the cutters, which revolve at about the same rate as an electric fan.

The runners and cutting knives of the machine can be adjusted so as to exactly fit the sewer, forcing the cutters to reach every inch of the sewer wall, leaving it as clean and sanitary as when first put down.

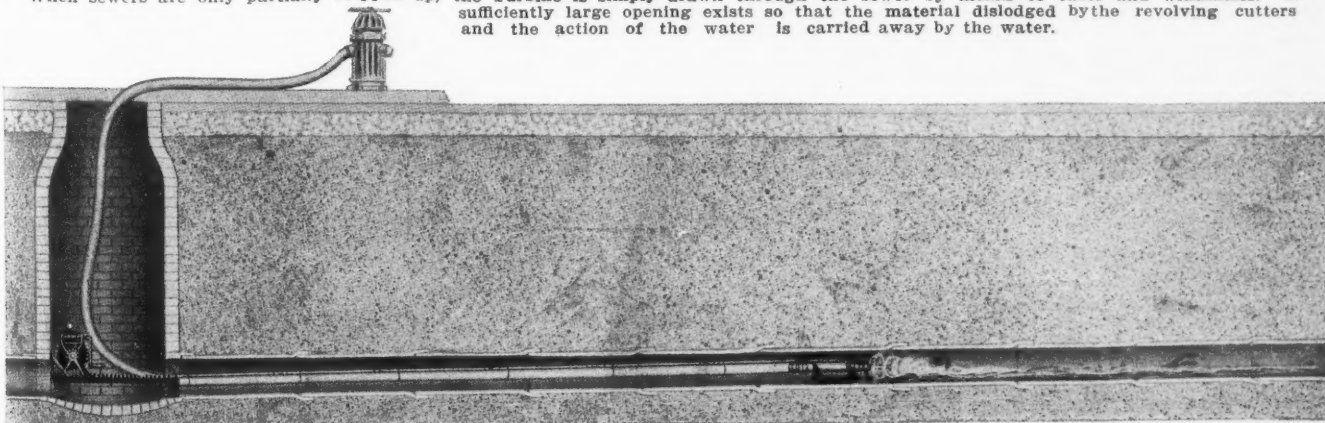
We will open up, clean and scrub your stopped up sewers at half the price you now spend to force a mere passage way, or will sell you the system subject to its making good in any test you may wish us to make.

This company will be pleased to send its experts to fully explain the system to officials of any city, upon receipt of a request.



TURBINE OPERATED BY WINDLASS

When sewers are only partially stopped up, the Turbine is simply drawn through the sewer by means of cable and windlasses. A sufficiently large opening exists so that the material dislodged by the revolving cutters and the action of the water is carried away by the water.



TURBINE OPERATED BY FORCING JACK

Used in completely stopped up sewers where it is impossible to get cable or rope through. The Turbine is lowered into the manhole at the low end of the sewer and water is turned on for a short time, cutting out the obstructing matter ahead of it until there is room to place the Forcing Jack.

The Turbine is protected by U. S. letters patent. For years it has been solving the most difficult sewer cleaning problems of leading municipalities. Anyone using a sewer cleaning device infringing on our rightful patents will be prosecuted to the full extent of the law and full damages will be demanded.
(Foreign Patents have been applied for.)

TURBINE SEWER MACHINE RENOVATING CO., 197 11th Street Milwaukee, Wis.

NOTICE TO CONTRACTORS

NOTICE TO CONTRACTORS—State of New York—Office of the State Commission of Highways, Albany, N. Y.—Pursuant to the provisions of Chapter 30, Laws of 1909, as amended by Chapter 646, Laws of 1911, and Chapter 80, Laws of 1913, sealed proposals will be received by the undersigned at their office, No. 55 Lancaster Street, Albany, N. Y., at 1 o'clock P. M., on Thursday, the 25th day of June, 1914, for the improvement of the following highways:

County.	Hy. No.	Name.	Approx. Length.	County.	Hy. No.	Name.	Approx. Length.
Cayuga	1175	Fairhaven Village	1.82	Ontario	1196	Gorham—Stanley, Part 2	1.89
Chemung	1195	Elmira City: Division St. and Grand Central Ave.	1.14	Rensselaer	1119-A	Troy City—Spring Ave.	1.72
Delaware	5340	East Branch—Sullivan Co. Line, Part 2	6.84	Rensselaer	1194	Rensselaer City: High St.	0.39
Genesee	5493	Batavia—Stafford, Part 2	0.27	Rensselaer	981-A	Defreestville—Couse	3.14
Lewis	1193	Lowville—Croghan	9.17	Rensselaer	1116-A	Castleton—Rensselaer, Parts 1 and 2	1.91
Lewis	1191	Carthage—Naumburg, Part 2	6.38	St. Lawrence	5497	Ogdensburg—Waddington, Pt. 1	9.79
Lewis	1192	Naumburg—Croghan	5.73	Schoharie	5494	Schoharie Village: Main St.	0.70
*Madison	5492	Hamilton—Bouckville	5.79	Suffolk	5488	Patchogue—Moriches	12.89
Oswego	5486	Oswego City: West Seneca St. and West Bridge St.	1.13	Sullivan	5490	Monticello Village—Broadway and Jefferson St.	1.56
Oswego	5487	Oswego City: East Ninth and Onelda Sts. and State Road	1.47	Steuben	5253-C	Jasper—Addison	4.37
Ontario	662	Rushville—Gorham	6.06	Westchester	5356	White Plains Village	2.24
				*Madison	1160	Oneida—Munnsville, Part 1	4.96

REPAIR.

Repair Cont. No.	Class of Work.	Road No.	Name.	Town.
660	Concrete No guarantee	508	Selkirk-Coeymans	Coeymans
530	Bit. Mac. and H. O. Appl. Partly guaranteed	505	Norwich—No. Norwich	{ Norwich & No. } Dutchess.
667	Bit. Mac. and C. O. Appl. Partly guaranteed	5092	Red Hook-Rhinebeck	Rhinebeck
668	H. C. TH. Hot Appl. No guarantee	841	Crown Point-Port Henry	Essex. Crown Point and Moriah
661	Bit. Mac. Guaranteed	456 { 5159 } { 5028 }	Little Falls-East Creek	Herkimer. Manheim
662	Bit. Mac. Guaranteed	339 811	East Creek—St. Johnsville	Montgomery. St. Johnsville
666	H. C. T. Cold Appl. No guarantee	154	Georgetown	Madison. Georgetown
651	Brick. Guaranteed	77	Georgetown-Otselic	Orange. New Windsor
577	Bit. Mac. & H. C. T. Appl. Partly guaranteed	436	Chester-Vails Gate	Rensselaer. Cornwall Bloomington-Grove
669	Bit. Mac. T. Binder. Guaranteed	9006	Albia-Wynantskill	Nassau. Brunswick and No. Greenbush
598	Git. Mac. Guaranteed	441	Jericho Turnpike-Plainview	Rockland. Oyster Bay
670	W. B. Mac. & H. C. T. Cold Appl. No guarantee	{ 5231 } { 5321 }	Pearl River-Nanuet	Saratoga. Orangetown
664	C. O. Appl. No guarantee	54 { 143 } { 587 }	Saratoga-Glens Falls	Westchester. Clarkstown
665	C. O. Appl. No guaranteed	{ 35 } { 20 }	Yonkers-White Plains	Westchester. Wilton
663	W. B. Mac. No guarantee	519	White Plains-Rye	Westchester. Greenburg
			Briar Cliff Manor-Echo Lake	Westchester. White Plains
			Echo Lake-Pines Bridge	Westchester. Ossining
			Mt. Kisco-Millwood	Westchester. New Castle
			White Plains-Armonk	Westchester. No. Castle
			White Plains-Cross Roads	Westchester. New Castle
			Mt. Kisco-Pleasantville	Westchester. New Castle

Maps, plans, specifications and estimates may be seen and proposal forms obtained at the office of the Commission in Albany, N. Y., and also at the office of Division Engineer Bertrand H. Wait, Realty Building, White Plains, N. Y., for contracts and highways in the counties of Dutchess, Nassau, Orange, Rockland, Suffolk and Westchester; also at the office of Division Engineer Harvey O. Schermerhorn, Humane Building, Albany, N. Y., for contracts and highways in the counties of Albany, Essex, Rensselaer and Saratoga; also at the office of Division Engineer Theron M. Ripley, Cleveland Building, Watertown, N. Y., for contracts and highways in the counties of Lewis and St. Lawrence; also at the office of Division Engineer James H. Sturdevant, Chamber of Commerce Building, Utica, N. Y., for contracts and highways in the counties of Herkimer, Madison and Montgomery; also at the office of Division Engineer Howard E. Smith, 901 Press Building, Binghamton, N. Y., for contracts and highways in the counties of Chenango, Delaware, Schoharie and Sullivan; also at the office of Division Engineer Charles J. McDonough, 433 South Salina St., Syracuse, N. Y., for contracts and highways in the counties of Cayuga and Oswego; also at the office of Division Engineer Perry Filkin, 423 Cutler Building, Rochester, N. Y., for contracts and highways in the counties of Genesee and Ontario; also at the office of Division Engineer Frederick S. Strong, St. Ann Federation Building, Hornell, N. Y., for contracts and highways in the counties of Chemung and Steuben.

The especial attention of bidders is called to "Information for Bidders" in the itemized proposal, specifications and contract agreement.

Proposals for each contract must be presented in a separate sealed envelope endorsed on the outside with the number of the highway or repair contract for which the proposal is made. Each proposal must be accompanied by a draft or certified check issued by a national or State bank in good credit within the State and payable at sight to the order of the State Commission of Highways for an amount equal to at least five per cent. of the amount of the proposal which such draft or check accompanies.

This draft or check will be held by the Commission until the contract and bond are duly executed. The successful bidder will be required to give a bond for fifty per cent. of the amount of the contract, such bond to be executed by a surety company to be approved by the Commission or a bond secured by the deposit of collateral securities to be approved by the Commission.

The right is reserved to reject any or all bids.

JOHN N. CARLISLE, Commissioner.

R. K. FULLER, Secretary.



BESSEMER BLOCK

THE MOST UNIFORM SHALE PAVING BLOCK MADE

Makes a Uniform Pavement that is Durable, Sanitary and Always in Repair

BESSEMER LIMESTONE COMPANY, Youngstown, O.

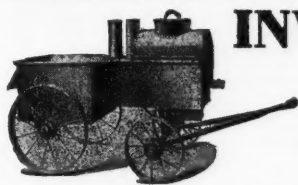
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THE PRODUCT OF 16 YEARS' PLANT BUILDING BY THE ORIGINATORS OF THE FIRST RAILWAY PLANT. IT STILL LEADS.

HETHERINGTON & BERNER INDIANAPOLIS, INDIANA



INVESTIGATE OUR CLAIMS



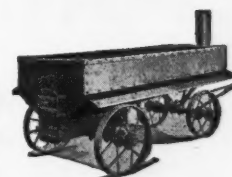
when ordering contractors' equipment and supplies! When you spend good money for tank wagons, portable tar heaters, gravel driers, combined gravel driers and tar heaters, etc., you should get the most value your money will buy!!

If you spend too much time getting your wagon or heater "to work" and then fiddling away more time and more money feeding it with repair bills, where have your profits gone?



Use Littleford Specialties and Make Sure

of satisfactorily long service!! We manufacture a full line of Tar Heaters, Gravel Driers, and other contractors' equipment. Catalog and prices mailed upon request.



LITTLEFORD BROTHERS, 451 EAST PEARL STREET, CINCINNATI, OHIO

The CUMMER One-Car ASPHALT PLANT

Capacity 2000 Square Yards 2 Inch Top or Macadam Daily

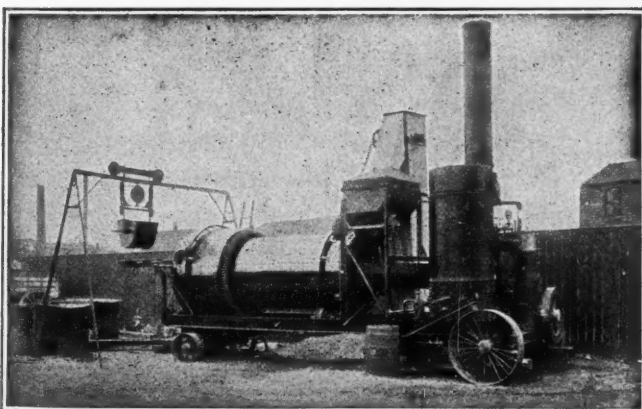
The CUMMER ROAD ASPHALT PLANT

Two Sizes. Three Units. Capacity 750 and 1000 Square Yards 2 Inch Top or Macadam Daily.

Plants in Stock.

THE F. D. CUMMER & SON COMPANY, CLEVELAND, OHIO

Can Show Them in Operation.



Warren's Portable Asphalt and Repair Plant.

Warren's Portable Asphalt and Repair Plant

Patented July 8, 1913. Others pending.

The Recognized Standard the World Over

REMEMBER

That Warren's Portable Asphalt and Repair Plant is the ONLY one that has ALL of the operations under direct control of the operator, and is the ONLY portable plant which can compete with regular types of asphalt plants in capacity, cost of operation, cost of maintenance and character of products. It does this, and more too; its portability gives it a range of usefulness which is distinctly its own. It is equally adapted to small or large work, was fully perfected by us by practical use in our own business before being offered to the public, and is a full-grown plant built to meet the exacting requirements of the bituminous paving industry.

Put Your Profits Into Your Pocket Instead of Into Repairs

Write for Explanatory Booklets.

WARREN BROTHERS COMPANY

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ST. LOUIS, MO.
409 Pierce Bldg.

ROCHESTER, N. Y.
49 West Ave.

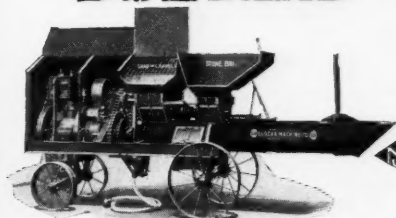
LOS ANGELES, CAL.
926 Calif. Bldg.

PORTLAND, ORE.
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PHOENIX, ARIZ.
221 Goodrich Bldg.

Manufacturers of All Types of Paving Plants

THE EUREKA SMILE



"Our Eureka Mixers are giving such EXCELLENT SATISFACTION that I have recommended to the Commissioner of this department that he purchase more Eureka's."—Arthur Layton, Supt., City of Detroit, Mich.

—GET THE EUREKA SMILE!

It is only half as heavy and bulky as an equally rated batch mixer; costs but half as much originally; costs but a third as much to operate it, cuts down expensive wheelbarrow gangs, works rapidly, continuously, smoothly, turning out absolutely uniform, unvarying, perfectly mixed concrete in a continuous stream and DOES PRECISELY AS MUCH WORK IN A GIVEN TIME AS THE EQUALLY RATED BATCH MIXER.

—GET THE EUREKA SMILE!

No guess-work. No wheeling. No waiting. Do you want to catch up with your appetite for more profits? SEND FOR EUREKA FACTS NOW.

EUREKA MACHINE COMPANY

20 Case St., Lansing, Mich.

NOTICE TO CONTRACTORS

NOTICE TO CONTRACTORS—State of New York—Office of the State Commission of Highways, Albany, N. Y.—Pursuant to the provisions of Chapter 30, Laws of 1909, as amended by Chapter 646, Laws of 1911 and Chapter 80, Laws of 1913, sealed proposals will be received by the undersigned at their office, No. 55 Lancaster Street, Albany, N. Y., at 1 o'clock P. M., on Monday, the 6th day of July, 1914, for the improvement of the following highways:

County.	Rd. No.	Name.	Approx. Length.	County.	Rd. No.	Name.	Approx. Length.
Albany	1198	Albany-Glenmont	1.25	Nassau	1203	Baldwin-Oceanside	1.56
Albany	5499	Albany-Bethlehem Center	2.38	Nassau	1202	Plainview-Massapequa Turnpike	4.41
Albany	1199	Cohoes City: Vliet Ave.	1.03	Ontario	5473	Geneva City: Hamilton St.	1.30
Allegany	5503	Andover-Alfred Sta.-Almond	12.06	Steuben	1104	Cohocton-Wayland, Part 1	4.09
Clinton	5475	Plattsburgh City: Peru & Charlotte Sts.	0.30	Steuben	5495	Bath-Hammondsport, Part 2	3.48
Dutchess	5489	Poughkeepsie City: South Ave. and Washington St.	0.79	Schuyler & Yates	5334-A	Watkins-Yates County Line	7.85
Jefferson	1197	Carthage-Naumburg, Part 1	1.81	Wayne	5451	Williamson-Sodus	5.94
				Wayne	5449	Ontario Center-Williamson, Pt.	2.28
				Westchester	5482	Ossining Village	2.17

Repair Cont. No.	Class of Work.	Road No.	REPAIR. Name. County.	Town.
594	H. C. T. Cold Appl. No guarantee	589	Nevis-Blue Store	Clermont
556	H. O. Appl. No guarantee	216	Roxbury	Roxbury
672	C. O. Appl. No guarantee	344	Millerton-Northeast Ctr.	Northeast
		537	Amenia-Wassaic	Pawling
		534	Northeast Ctr.-Sharon Sta.	and
		612	Pawling-Dover Town Line	Amenia
648	H. C. T. Cold Appl. No guarantee	714	Dansville-Mt. Morris, Sec. 1	W. Sparta
		715	Dansville-Mt. Morris, Sec. 2	Groveland
		482	Dansville-Mt. Morris, Sec. 3	Mt. Morris
613	Bit. Mac. & Conc. Partly guaranteed	328	Valley Road-Marcellus	Marcellus
		329	Valley Road-Camillus	Camillus
674	H. C. T. Cold Appl. No guarantee	153	Newburg-Campbell Hall	Newburg and New Windsor
675	H. C. T. Cold Appl. No guarantee	139	Hamilton Bridge	Vernon
		271	Utica-Oneida Castle, Sec. 2	
673	C. O. Appl. & Bit. Mac. Partly guaranteed	569	Baldwin Place-Mahopac	Carmel

Maps, plans, specifications and estimates may be seen and proposal forms obtained at the office of the Commission in Albany, N. Y., and also at the office of Division Engineer Bertrand H. Wait, Realty Bldg., White Plains, N. Y., for highways and contracts in the counties of Columbia, Dutchess, Nassau, Orange, Putnam and Westchester; also at the office of Division Engineer Harvey O. Schermerhorn, Humane Bldg., Albany, N. Y., for highways in the counties of Albany and Clinton; also at the office of Division Engineer Theron M. Ripley, Cleveland Bldg., Watertown, N. Y., for highways in the county of Jefferson; also at the office of Division Engineer James H. Sturdevant, Chamber of Commerce Bldg., Utica, N. Y., for contracts in the county of Oneida; also at the office of Division Engineer Howard E. Smith, 901 Press Bldg., Binghamton, N. Y., for contracts in the county of Delaware; also at the office of Division Engineer Charles J. McDonough, 433 S. Salina St., Syracuse, N. Y., for highways and contracts in the counties of Onondaga and Wayne; also at the office of Division Engineer Perry Filkin, 423 Cutler Bldg., Rochester, N. Y., for highways and contracts in the counties of Livingston and Ontario; also at the office of Division Engineer Frederick S. Strong, St. Ann Federation Bldg., Hornell, N. Y., for highways in the counties of Allegany, Schuyler, Steuben and Yates.

The especial attention of bidders is called to "Information for bidders" in the itemized proposal, specification and contract agreement.

Proposals for each contract must be presented in a separate sealed envelope endorsed on the outside with the number of the highway or repair contract for which the proposal is made. Each proposal must be accompanied by a draft or certified check issued by a national or State bank in good credit within the State and payable at sight to the order of the State Commission of Highways for an amount equal to at least five per cent. of the amount of the proposal which such draft or check accompanies.

This draft or check will be held by the Commission until the contract and bond are duly executed.

The successful bidder will be required to give a bond for fifty per cent. of the amount of the contract, such bond to be executed by a surety company to be approved by the Commission, or a bond secured by the deposit of collateral securities to be approved by the Commission.

The right is reserved to reject any or all bids.

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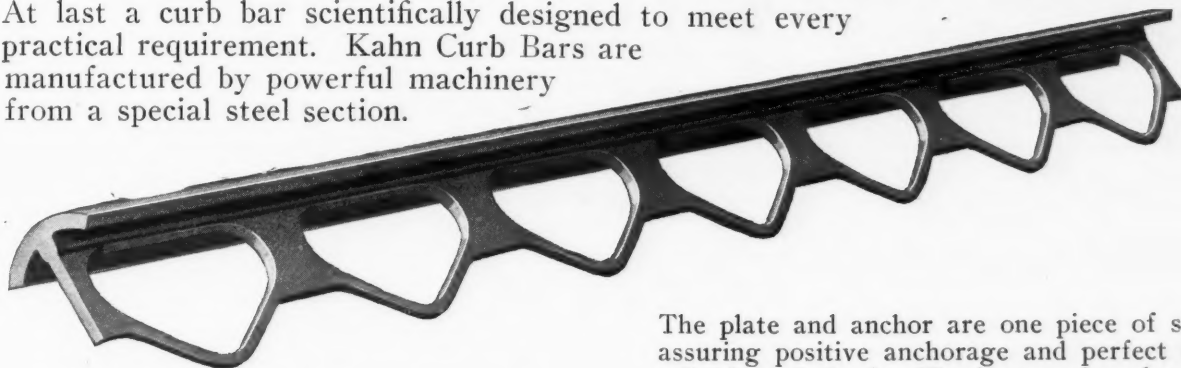
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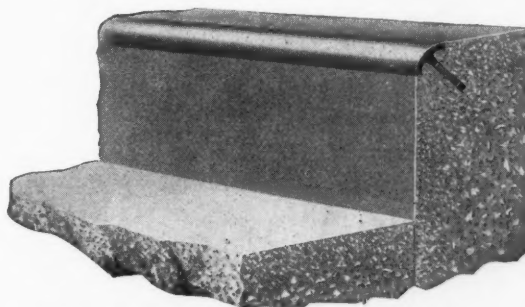
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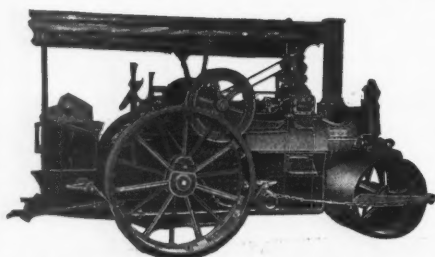
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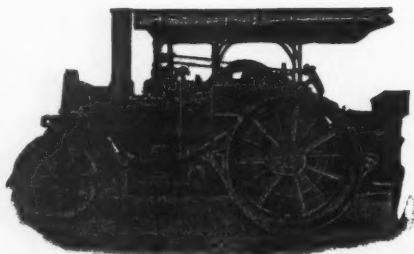
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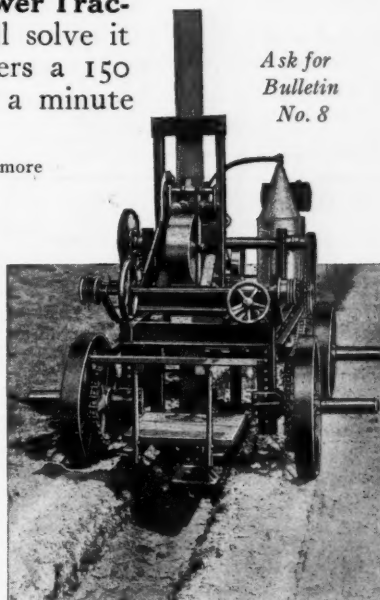
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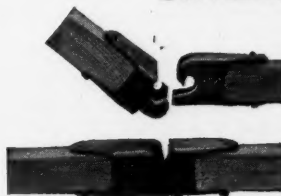
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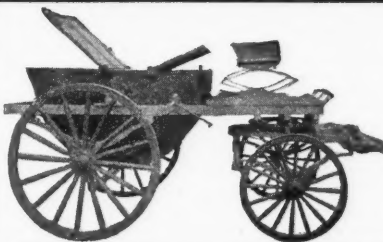
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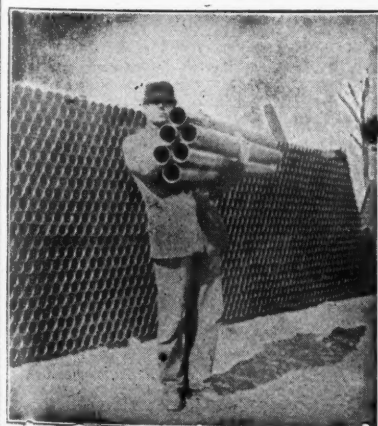
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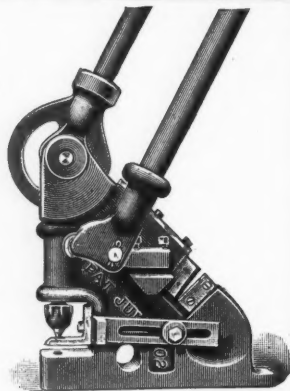
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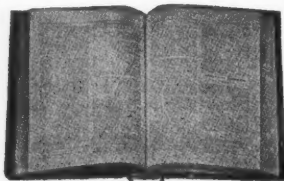
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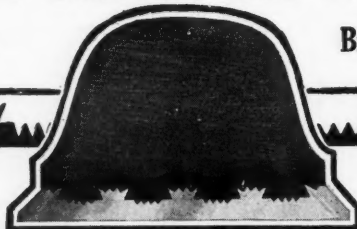
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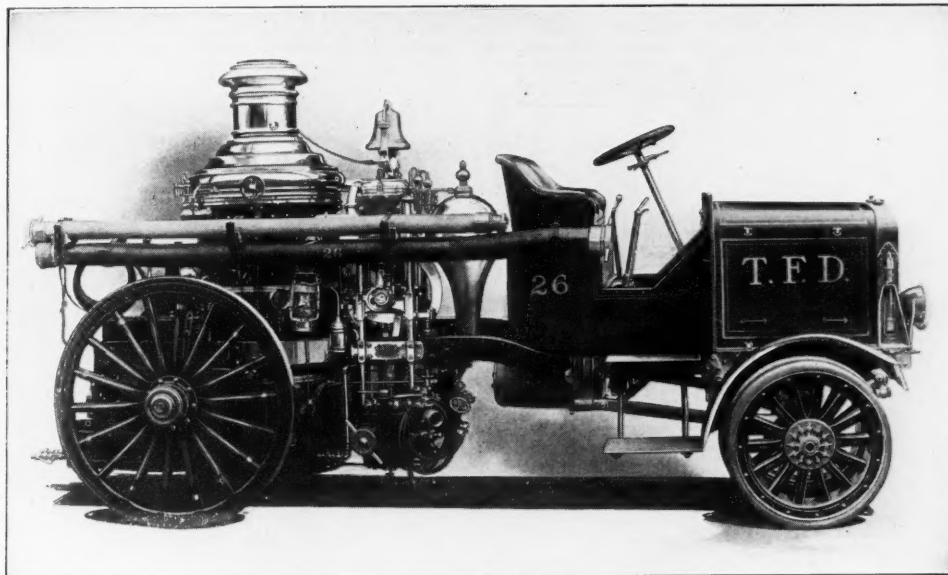


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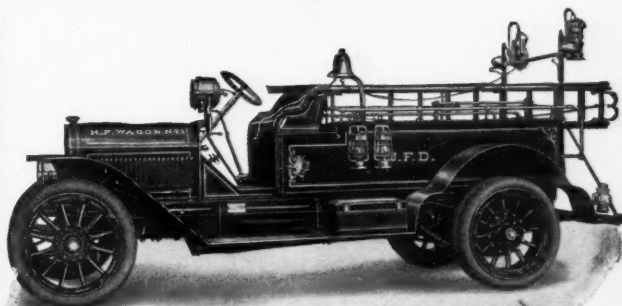
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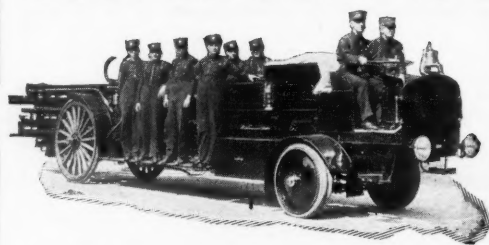
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